POLITICAL ECONOMY, POLITICAL ENTREPRENEURSHIP AND BIOFUELS REGULATION IN THE US

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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

POLITICAL ECONOMY, POLITICAL ENTREPRENEURSHIP AND BIOFUELS REGULATION IN THE US

presented by Paula T. Moura,

a candidate for the degree of master of science,

and hereby certify that, in their opinion, it is worthy of acceptance.

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Professor David O'Brien

Professor Wyatt Thompson

DEDICATION

This thesis is dedicated to my parents, Mario and Ana Silvia, the base for who I am and for everything I have accomplished in my life. This would have never been possible without your support. Thank you!

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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

ABSTRACT

This paper draws on theories of regulation from the political entrepreneurship and political economy fields to explore the dynamics of the US biofuels market. The conducted case study addresses questions regarding the life cycle and development of this industry and attempts to identify the actors, the roles they play(ed) and the driving forces shaping it. Archer Daniels Midland (ADM) is identified as having played a significant role through exercising immense political entrepreneurship, which laid ground for the present market. As the market matured, profit incentives stimulated the emergence of competing actors, who in their combined actions, shaped regulation of the biofuels industry. Although interest group action may not be the only factor explaining the creation and persistence of the US biofuels market, I conclude that it is a significant factor.

1. Introduction

1.1. Biofuels

Biofuels, as they have commonly become known, are a variety of fuels derived from biomass. These fuels can include solid biomass, liquid fuels and other biogases. The increased use of biofuels is due not only to the environmental risks that they neutralize, but also to an increased concern from countries like the US to become more energy independent and secure. Because biofuels are derived from plants and, consequently, are CO_2 neutral[1] they are a more environmental friendly source of fuel than the most commonly used fuels derived from crude oil (i.e., gasoline and diesel). Currently, the most commonly known type of biofuel is ethanol, which is mainly produced from agricultural crops, such as corn and sugarcane. However, gasoline and diesel remain as the most widely used and most energy efficient[2] fuels in the world. Replacing them has proved to be a challenging task and one that has raised many controversies. In the center of such controversies are the food versus fuel debate (because ethanol is mainly produced from agricultural crops) and the real environmental impacts and

[1] CO_2 neutral energy systems: CO_2 neutral fuels do not increase the concentration of CO_2 in the atmosphere (Muradov and Veziroglu, 2008).

[2] Energy efficiency is the ratio between energy services and energy output. In other words "getting the most out of every unit of energy you buy" (Herring, 2006, p. 11). When referring to fuels in the US, it is usually measured as a ratio between miles traveled per gallon of fuel.

consequences of ethanol production. In the US, ethanol is produced from corn and the costs of producing corn ethanol relative to gasoline or diesel are high. This cost discrepancy has led to government intervention through energy policies that promote and support the production of domestic ethanol. This has created much debate among a diverse group of stakeholders such as farmers, livestock producers and automobile manufacturers among others.

1.2. Biofuels regulation

Biofuels have been used as automobile fuels for more than a century in the US. In 1908, Henry Ford created the Model T to run on ethanol and gasoline or on a mixture of both fuels. When World War I began, the increased need for fuel boosted the demand for ethanol. After the war, the demand for ethanol fell because gasoline became the most widely used fuel. In the years that followed, ethanol was highly disregarded. New oil discoveries and the lower production costs of gasoline caused it to become American's fuel of preference (Solomon *et al.,* 2007).

In the United States, the production of biofuels, especially ethanol, has been subsidized since the 1970's oil crisis, when the government sought to reduce the country's dependence on foreign oil. In the past ten years the federal government has continued to heavily subsidize corn ethanol. Domestic output has increased to almost three times what it was in the 1990's, especially because of the Renewable Fuels Standard (RFS), a mandate imposed by the US government to promote the use of more

renewable sources of energy for fuel (Solomon *et al.*, 2007). The last revision of the RFS (2010) mandates 12.95 billion gallons of ethanol to be blended into transportation fuel (gasoline and diesel) in 2010 and 36 billion gallons of renewable fuels to be blended into transportation fuel by 2022. According to the EPA (2010a), the latter corresponds to a 7% reduction in the gasoline and diesel consumption forecast in 2022 (about 13.6 billion gallons of petroleum based gasoline and diesel). Although a mandate is in place, the subsidy for energy companies is still present in the form of a 45 cent per gallon tax credit for blending ethanol with gasoline. Furthermore, the trade barriers imposed by the government in the form of tariffs on imported ethanol are justified as a way of offsetting the tax credit given to fuel blenders and encouraging domestic production of ethanol.

Ethanol production in the US has increased significantly since it started being subsidized in the late 1970's. According to the Renewable Fuels Association (RFA), in 2009 corn ethanol output was 10.6 billion gallons, a staggering increase from 175 million gallons in 1980[3].

1.3. Problem statement

US biofuel policies and regulation have been a controversial topic among scholars. Questions regarding the effectiveness of subsidies and trade policy in achieving energy security and environmental goals have been repeatedly raised (e.g., Hahn and

[3] US ethanol industry statistics – Renewable Fuels Association. Available online at: http://www.ethanolrfa.org/pages/statistics.

Cecot, 2009; Runge, 2010). The body of literature on biofuel and ethanol policy and regulation in the US is extensive and has evolved and developed mostly in economics. Most research done by economists has been directed towards the welfare effects and economic policy implications of biofuel regulation, i.e. focusing on the effects of regulation on the market (e.g., Gardner, 2007; Taheripour and Tyner 2007; Babcock, 2010). Other scholars in the economics field have used political economy approaches to address the issue and are generally more concerned with the effectiveness of environmental policies (in a broad sense) and the appropriate roles of government, thereby focusing on the nature of regulation itself (e.g., Zywicki, 1998; Zywicki, 2002; Joskow and Schmalensee, 1998).

However, there seems to be a pervasive gap in the literature focusing on the process linking regulation to the actors in the US biofuels market. Whereas economists focus on the effects of regulation on the market and on the regulation and regulatory apparatus itself, there are few studies targeting the forces that drive and shape biofuels regulation in the US.

1.4. Objective

The objective of this study is to begin to bridge this gap by identifying and understanding the actors and forces that influence biofuels regulation in the US. Specifically, I seek to address three research questions:

1- Who are the actors and what incentives do they have to influence policy?

2- What roles do these actors play in influencing policy?

3- How have the roles they play influenced current biofuel policy?

I draw on the theories of regulation proposed by the political economy field and the political entrepreneurship field to explore the actors and the dynamics of the biofuels regulatory process in the US. I offer a detailed analysis of these two theories and argue that the relationship between them provides useful insight to understanding the influence of the market actors on biofuel regulation. I use a case study approach to address the questions and hypotheses set forth in this thesis.

1.5. Project significance

The search for "cleaner" sources of energy and energy independence has significantly contributed to the emergence of a correlation between energy products and agricultural commodities. Because most biofuels are currently produced from agricultural commodities, such as corn and sugarcane, there is increased pressure on agricultural markets that are now responsible for producing not only food, feed and fiber, but also fuel (Taheripour and Tyner, 2008). Although biofuel policies are generally labeled as energy policies, they have direct implications on agricultural markets, especially because of corn ethanol in the US and sugarcane ethanol in Brazil.

As has been argued by many economic scholars (which will be presented below), current biofuel policy has significant and negative welfare consequences for society. Also, it is commonly agreed that politics and pressure groups are a central force

influencing policy adoption. A deeper understanding of the actors and the institutional factors that drive entrepreneurial behavior and rent seeking to occur in the biofuels regulation market is likely to shed light on the dimensions of policy reform or institutional reform that are called for to lessen the negative welfare costs of current policy.

Furthermore, if the hypotheses proposed regarding the relationship between the theories of political economy and political entrepreneurship hold true, they can be usefully applied beyond the biofuels market. The conclusions derived from this study can be further implemented and tested on different agricultural markets and problems.

1.6. Limitations

The study relies on a single case study to make generalizations about the research problem and the proposed relationship between the presented theoretical perspectives. It should be recognized that the generalizations are of analytical nature and not of statistical nature (Yin, 1994). This means that the case study is generalizable to the theoretical propositions set forth in the study, and not to a population or universe (Yin, 1994). However, because the study relies on a single case study, there should still be caution in making analytical generalizations. A more ample study, with multiple case studies would increase the credibility of the results. Due to limitations of resources, such an endeavor is not feasible at this time.

2. Literature Review

2.1. Agricultural Policy

The study of agricultural policy dates back to the eighteenth and early nineteenth centuries when Adam Smith and David Ricardo sought to understand the welfare impacts of the Corn Laws in England. Due to the importance of agriculture to most economies in human history, agricultural economics and the study of agricultural policy became an independent field of study (Sumner *et al.,* 2010). The research on agricultural policy has always been focused on the same issues that are central today. According to Sumner *et al.* (2010), in their review of the evolution of the economics of agricultural policy research, early research was focused on the farm problem[4] and how agricultural transactions and relationships were different from other markets. Scholars were concerned with the migration of labor out of agriculture and with the risks and uncertainties that made it hard for farmers to know the *ex post* consequences of their *ex ante* decisions. Many scholars began to propose that government intervention through price support programs and other policy tools could be the answer to the farm problem. However, such intervention would come to generate new sets of questions

[4] The mainstream view of the farm problem is that the particular structure of the agricultural economy generates low and unstable income to farmers, which requires the government to intervene to support production (Gardner, 1992; Sumner *et al.*, 2010).

regarding the efficiency and welfare implication of government agricultural policies. Agricultural economists sought to analyze the costs and benefits of government policies and their redistributive implications among interest groups such as producers, consumers and taxpayers. This research was informative for understanding different policy options and making more efficient policy decisions. Along the same line, a wide body of literature has developed focusing on the economics of government R&D policy, quota and price discrimination policies, among others.

In the late 1970's and early 80's, economists started to use political economy models to study agricultural policy. Mainly, such research was triggered by the development of rent seeking and interest group government models developed by scholars such as Anne Krueger, Gary Becker, Richard Posner, Gordon Tullock, and James Buchanan (Sumner *et al.*. 2010, p. 410-411). Agricultural economists used the ideas presented by such scholars to understand the role of government in allocating resources to agriculture and the reasons "why governments do as they do in agriculture" (De Gorter and Swinnen, 2002, p. 1894). The literature on the political economy of agricultural policy has been surveyed by many scholars such as Swinnen and Van Der Zee (1993), De Gorter and Swinnen (2002), and Swinnen (2010). The recent literature has been influenced by public choice theory and the economics of politics and focused on government intervention in agricultural markets. The central assumption is that "agents, like voters, politicians, and lobbyists, are rational, self-interested, and maximize an objective function in responding to incentives and constraints" (De Gorter and

Swinnen, 2002, p. 1903). This view opposed the traditional neo-classical economics Pigovian theory that governments intervene to correct for market failures in private markets and re-establish equilibrium (Swinnen and Van Der Zee, 1993).

According to De Gorter and Swinnen (2002), the approach was used at first to analyze how governments redistributed income and allocated resources over time across sectors and countries. Much of this literature was based on Olson's theory of collective action. According to Olson (1971), the ability of groups to organize for collective action depends on group size and heterogeneity. Scholars argued that the patterns of agricultural policy interventions could be explained by looking at farm group lobbying and the influence of lobby groups in political outcomes. Beyond redistribution policy, agricultural economists sought to apply the political economy approach to understand the choice of policy instruments in agricultural markets. Specifically, this approach was used to understand why the government created and implemented inefficient policies that did not maximize social welfare. This branch of the literature, however, is less developed, especially in terms of empirical analysis, than the one on redistribution (De Gorter and Swinnen, 2002).

In summary, there is widespread consensus that government policy choice does not always maximize social welfare. Redistribution occurs as a result of policy choice and, therefore, the surveys of the literature call for a more integrated perspective of the two approaches. Furthermore, De Gorter and Swinnen (2002) call for more research on

the “institutional and economic factors affecting rent seeking and policy instrument choice” (p. 1932).

2.2. Biofuel regulation and subsidies

As stated before, most economic analyses of biofuel regulation have been focused on identifying the costs and benefits, winners and losers, welfare effects and implications of biofuel policies in the US. Specifically, scholars have been concerned with the effects of the biofuel subsidies in the US. Gardner (2007) uses supply and demand models to identify and compare the sources of gain from ethanol subsidies to the sources of gain provided by commodity subsidies to farmers from a general welfare perspective. He concludes that the likelihood of ethanol subsidies generating social gains is low. However, his analysis indicates that farmers favor ethanol subsidies because the demand for ethanol is more inelastic than the demand for other uses of corn. Therefore, farmers gain more from producing corn for ethanol than for other uses. Without the ethanol subsidy, demand moves from a less price sensitive market to a more price sensitive market, which reduces the prices farmers receive for corn. Rajagopal *et al.*, (2007) use supply and demand models to analyze the short run economic impact of the increased production of corn ethanol on welfare in the US. They conclude that “a simple welfare analysis of US corn ethanol suggests that the impact of producing biofuels from food crops will be greater on food prices than on energy prices” (p. 8). Furthermore, they suggest that increased production of biofuels is a threat to

food security in the US and that a smooth transition to a renewable fuel economy will be achieved only through an incentive system that encourages technological innovation.

Taheripour and Tyner (2007) use partial and general equilibrium models to examine the distributional impacts of ethanol subsidies in the US. The authors base their analysis on the theory of tax incidence[5]. They argue that the benefits from ethanol subsidies are not necessarily gained only by ethanol producers. Taheripour and Tyner show that the benefits of the subsidies are passed along the supply chain from producers to farmers and from farmers to land owners.

Hahn and Cecot (2009) examine the costs and benefits of increasing ethanol use in the US based on an Environmental Protection Agency analysis of the Renewable Fuels Standard (RFS). The authors use a "marginal benefits"[6] model to quantify the benefits and costs of the standard based on the EPA estimations for ethanol production in 2012. They argue that the costs of increasing ethanol production as mandated by the RFS are likely to be greater than the benefits. Furthermore, the authors propose that the effectiveness of the government biofuel policies in achieving environmental and energy security goals are questionable. Hahn and Cecot suggest that a more careful economic analysis of the EPA's own report would reveal the unproductive nature of the ethanol subsidies in the US. Furthermore, they argue that support for ethanol will decrease as

[5] "This theory mainly elucidates that the statutory incidence of a tax (or a subsidy) can be different from its economic incidence" (p. 2).

[6] According to the authors: "we monetize cost and benefit impacts using estimates obtained from the literature on the benefit per ton of emission reductions and benefit per barrel displaced" (p. 281).

interest groups, such as livestock producers and environmentalists, vocalize their opposition to corn ethanol.

Babcock *et al.*, (2010) also examine the cost and benefits of current US ethanol policies. However, their analysis is directed towards identifying the costs and benefits to taxpayers, consumers and producers if the current policy and subsidies are not extended. The authors propose a series of hypothetical scenarios with different ethanol policies and analyze the short term and long term impacts they would have on the groups identified above. Babcock *et al.* use a stochastic model to estimate the costs and benefits of ethanol policies by calculating the market clearing prices for US ethanol, Brazilian ethanol and US corn. They conclude that elimination of the tariff on imported ethanol would have close to no impact on US ethanol and corn markets because of the strong demand for ethanol in Brazil and the saturation of the ethanol market in the US. Furthermore, they conclude that the elimination of the tax credit would have an impact on the quantity of ethanol produced in the United States, but it would be small as long as the mandates were maintained. The authors estimate that if the tax credits were eliminated, taxpayers would save over $6 billion because the burden of meeting the mandates would be transferred to blenders and consumers of fuel. Therefore, the benefits to taxpayers of eliminating tax credits and import tariffs would outweigh the costs to consumers and producers.

De Gorter and Just (2007a, 2007b, 2008, 2009a) focus on the interactions between the different policies established in the US biofuels market and on their

interactions with other policy instruments related to agricultural commodities in the US. De Gorter and Just (2007a) seek to understand and quantify the economic impact of the biofuel policies in the US. They argue that the combination of biofuel tax credits and a binding mandate has serious social cost implications. In order to assess the real economic implications of the biofuels mandate and the excise-tax credit and their interaction effects when both are in place at the same time, the authors propose a framework based on a model of the gasoline and corn markets in the US. The empirical evidence provided in the study supports the theory presented by the authors on the interaction effects of tax credits and mandates. De Gorter and Just (2007b) analyze the economic impact and interaction effects of the U.S biofuel import tariffs combined with a biofuel consumption mandate and a tax credit. The authors provide a detailed analysis of the import tariff, tax credit and consumption mandate in the US biofuel regulation and examine the impact of the several combinations of these three policies.

De Gorter and Just (2008) present an analysis of the US biofuel policies and the social costs and benefits associated with it. They identify the winners and losers and quantify the gains and losses that they face. The authors argue that there are interaction effects between the biofuel policies established by the US government and that these interactions have large welfare implications. De Gorter and Just argue that it is important to understand how these policies interact, because as they conclude, one policy alone may be more efficient than two or three in place simultaneously. They conclude that:

> Mandates are more efficient than tax credits for the same level of ethanol production because mandates result in relatively higher gasoline prices and lower CO_2 emissions and miles traveled. New US energy legislation mandates the use of renewable fuel but calls for continuing current biofuel subsidies that will cost taxpayers billions of dollars. (p. 167).

De Gorter and Just (2009a) develop an analytical framework to analyze the welfare effects of the US biofuel tax credits. Furthermore, they seek to examine how this impact changes when taking into consideration the price contingent farm subsidies in the US. De Gorter and Just (2009b) present an analytical framework to evaluate the economic impacts of the second version of the Renewable Fuels Standard established by the US government. The authors once again analyze the interaction effects of a blend mandate with a tax credit and conclude that: "while the tax credit in the absence of a mandate acts as a consumption subsidy for biofuels, the tax credit with a mandate becomes a consumption subsidy for fuel – both biofuel and oil based fuel" (p. 739). Therefore, the authors suggest that governments need to further evaluate the economic implications of biofuel policies, as they can be counterproductive and counteractive to initial energy security and environmental goals and cost billions of dollars to taxpayers.

Yano *et al.* (2010) question the rationality behind the current mix of US biofuel policies. The central arguments in this paper are partially derived from and in line with Babcock *et al.* (2010). The authors seek to analyze the impact of current US biofuels policies on the future evolution of the domestic and global markets for ethanol. They argue that the current mix of a mandate, a tax credit and an import tariff are likely to

provide perverse incentives for blenders and corn ethanol producers in the US. The amount of renewable fuels to be blended into gasoline is mandated, but the consumption of such blended fuel does not have to be domestic. Because cars in the US are not currently produced to run on higher ethanol gasoline blends, the domestic demand for such product is constrained, even though there is a consumption mandate. Under the current 10% blend wall, it would be impossible to reach the level of renewable fuels consumption under the RFS mandate. In this scenario, the blenders' tax credit and the import tariff could have significant implications. According to the authors renewing the tax credit under the current blend wall "would increase fossil fuel consumption by depressing fuel prices or act as an export subsidy" (p. 3). The authors conclude that if the goal is to substitute fossil fuels for more renewable sources of energy, policies need to be revisited and focused on the development of other biofuel technologies and on more flex fuel vehicles.

Runge (2010) examines the US biofuel policies and their economic impacts for the US. The author suggests that policy reforms are called for as a response to a number of issues that the government has not accounted for carefully: food insecurity, "subsidy stacking" (as pointed out by De Gorter and Just) and the environmental consequences of corn ethanol expansion. Runge concludes that current policy shoud be reviewed and reformulated to take into account the real impacts that biofuel production has on food systems and on the environment.

Other scholars in this field of study have focused on the impact of trade distortions imposed by the US on ethanol imports. Gonzalez *et al*. (2007) derive an equilibrium trade model to measure the welfare effects of the trade distortions imposed by the US government on Brazilian ethanol. The authors estimate the real value of the deadweight loss to society with the trade distortions in Brazil and in the US. They conclude that society would benefit from the elimination or reduction of the tariff on Brazilian ethanol because of Brazil's advantage over the US in the production of ethanol. Jank *et al.* (2007) evaluate the US and EU biofuel trade policies and discuss their implications for developing countries. They argue that the EU and the US could benefit from expanding their imports from developing countries. By reducing trade barriers and increasing biofuel imports from developing countries, developed countries can reduce the price pressures on domestic feedstocks and the burden of government subsidies on taxpayers, while having more flexibility in dealing with rapid changes in oil prices.

It becomes clear from this literature assessment that current biofuel policies have serious welfare effects to society. Also, it is questionable whether these policies are effective for achieving energy and environmental goals. The political game played by interest groups to influence policy and protect private interests is likely to have a large role in the explanation of such policy outcomes. Some scholars, especially in the political economy and political science literatures, have addressed this issue, as will be presented in the next section.

2.3. Political economy of environmental regulation

As shown above, economists have been successful in identifying and quantifying some of the welfare effects of US biofuel policies as well as some of the winners and losers under current market regulation. Such conclusions leads to the question of why policies that have negative social welfare effects were originally adopted and why they persist. Economists and political scientists have tackled this question mostly using public choice theory and focusing on the rent seeking behavior of private interest groups.

Zywicki (1998, 2002) is concerned mainly with the effectiveness of the environmental regulation system in the US and the role of environmental interest groups in this system. Zywicki (1998) uses a public choice model to explain why the current centralized, command and control model of environmental regulation persists in the US. He argues that such process is inefficient because it allows special interest groups to use the "apparatus of government" (p. 845) to capture rents to themselves at the expense of the general public. The author questions the mainstream idea that industry polluters oppose regulation and that public environmental interests favor regulation. Instead, he proposes that the system is sustained by the relevant special interest groups (i.e., industry, environmental interest groups, regulators and politicians, and lawyers), who share a common goal and are committed to the current structure of environmental regulation. Zywicki concludes that the inefficient system will persist while power is centralized in Washington. He suggests that the only way to minimize

political and environmental externalities simultaneously is through constitutional reforms that:

> Reinvigorate federalism and separation of powers, protect private property rights, and that enforce limitations on the ability of special interest groups to use the might of the federal government to transfer wealth from the public to themselves. (p. 920-921)

Helland (1998) analyzes the Clean Water Act of 1972 to examine the consequences of a federalist system for environmental regulation. The author builds on Peltzman's (1976) model of regulation to understand the extent to which local governments respond to local or national interests when national policy enforcement is delegated to them. He proposes three alternative hypotheses regarding the level of authority that state officials have compared to the federal government. The first is that federal government completely abdicates its power to enforce regulation when the task is delegated to state/local level governments. Second, the federal government loses no power when delegating enforcement authority to local governments because of their power to threaten or provide incentives to local governments. The final hypothesis stands between the extremes. The federal government loses some authority and control over regulatory enforcement when delegating to local governments, which implies that local governments will also have some authority over regulatory enforcement. The author concludes that in a federated system, official will seek to alter the stringency of regulation to maximize support from external political actors, whether they are national or local interest groups. Therefore, although in the federated system political forces can

have different impacts in different states, local government officials still respond to interest group pressure and exhibit rent seeking behavior.

Zywicki (2002) questions the assumption, commonly made by economists in self interest models, that environmental interest groups sacrifice their particular interests in defense of the public interest. He draws on the "Bootleggers and Baptists"[7] model developed by Bruce Yandle (1983) to question the analogy of environmental interest groups to "Baptists". The author suggests that a public choice model of private advantages explains the behavior of environmental interest groups better than a model of public interest. He argues that environmental interest groups often tend to misrepresent and manipulate information to "mislead and 'scare' the public" (p.317). Also, he poses that environmental interest groups, like all other interest groups, take advantage of the political system to gain benefits for themselves at the expense of the public and exert a large amount of power over regulation mainly because they are perceived as representatives of the general public interest. Zywicki concludes that the environmental interest groups are driven by the pursuit of power, prestige and wealth and, therefore, driven by rent seeking behavior like any other private interest groups.

Joskow and Schmalensee (1998) use a political economy approach to analyze the distributional effects of the US acid rain program established in 1990 by the Clean Air Act Amendments. The acid rain program is based on a cap and trade mechanism, where

[7] Bootleggers and Baptists: This famous political model developed by Bruce Yondle in 1983 posed that groups with opposing moral values can have the same vote. He applied the theory to the regulation of alcohol, where religious groups would vote for the prohibition of alcohol sale on Sunday because it is a sacred day and bootleggers would also vote for the prohibition so that they could stay in business and have monopoly power for one day of the week.

emissions permits are distributed by the government and can be traded in the market by the relevant parties. The authors argue that in such processes, where political institutions are responsible for distributing such valuable permits, the likelihood of special interest group politics and rent seeking behavior being present is high. Joskow and Schmalensee seek to understand how the allocation of emissions permits is influenced by rent seeking behavior from special interest groups. They analyze the emissions permit allocations by state and quantify the distributive implications of the acid rain program under alternative allocations. The authors conclude that, before the acid rain program of 1990, some high-sulfur coal producing and burning states were able to avoid new acid rain regulation and shape existing regulation of sulfur dioxide emissions. However, their results for the post 1990 acid rain program did not have great explanatory power. The only conclusion derived by the authors was that:

> The fight to grab allowances, within a range of allocations that could not be easily defeated in the Senate or House, reflects both a more complex and a more idiosyncratic pattern of political forces than one might expect from previous work on the political economy of clean air. (p. 81)

The four previous studies lead to the conclusion that rent seeking behavior is present in command and control hierarchical systems as well as in market based environmental policy programs. Such inference is an indication that the effectiveness of environmental regulation may depend on more than the kind of regulatory system in place. A deep understanding of the forces that shape environmental regulation and

outcomes will likely shed light on the larger institutional changes that take place through the influence of special interest groups.

Johnson and Libecap (2001) analyze the ethanol subsidy program in the US to question the analogy, set forth by scholars in the literature (e.g., Wittman, 1995 and Becker, 1983), between democratic politics and competitive markets. These scholars argue that, because there is competition between politicians for elective office, enough information will be provided for voters to make educated decisions about the benefits and costs of government transfer programs. Johnson and Libecap argue that even with competition between politicians, it is difficult for voters to obtain accurate information about transfer programs. Voters rely on the government to obtain such information and there is an incentive alignment problem between politicians and voters because politicians do not have incentives to transmit accurate or complete information to voters. The authors suggest that, whereas competition between politicians may not be an effective means of transferring accurate information to voters, competition among interest groups may be. However, they conclude that even among conflicting interest groups, information obfuscation takes place because the information reflects specific interests and is not neutral.

> Although competition among relatively powerful interest groups will provide an expanded information set to voters, that set will be characterized by conflicting claims aimed at offsetting or discrediting the information advanced by the opposing group. (p. 128)

Lastly, the authors conclude that information obfuscation is costly and needs to be taken into account when evaluating the general welfare effects of government transfer programs.

In this section, it is apparent that private interest groups impact the effectiveness of environmental regulation and that their behavior is driven by factors such as rent seeking and information advantages. However, as stated before, the explanation for the ineffectiveness of environmental regulation may depend on other factors, such as the influence of entrepreneurial actors in shaping regulation and outcomes. There is a gap in the literature focusing on the way that regulation comes into place and the actors that play a role in shaping it. Also, there are no studies focused specifically on the biofuels market in the US. From the analysis of the economics literature, it becomes clear that the biofuels market presents complexities and particularities that are noteworthy.

3. Conceptual framework: theories of regulation

In this section, the theories of political economy and political entrepreneurship of regulation and rent seeking are used to shed light on the forces that influence and shape regulation in the biofuels market.

3.1. Political economy theory of regulation

Restrictions upon economic activity established by governments are a given in market-based economies (Krueger, 1974). The interest in studying government intervention in market-based economies dates back to the early 1900s, as well as the controversial question of whether regulation serves public interests or private interests. The public interest theory of regulation, although controversial in its origins and contributions[8], sought to explain regulation as a mechanism to protect and benefit the public at large. However, this notion was opposed by the seminal work of Bentley in "The Process of Government" (1908), where the idea that governments serve the public interest was dismissed and the notion of groups exerting influence on regulation to their own benefit introduced.

[8] Hantkes-Domas (2003) questions the existence of the "Public Interest Theory of Regulation". He argues that the origins and originators of such theory are unknown and seeks to analyze law, politics and academic writings in order to propose that the theory does not really exist.

The political science literature on regulation evolved immensely with many scholars following the group interest ideas presented by Bentley (see Bernstein, 1955; Fainsod and Gordon, 1948; Leiserson, 1942). In the 1950s, the public choice literature emerged from the work of Black (1948, 1958), considered the father of public choice theory. It was further developed by scholars such as Downs (1957), Buchanan (1960, 1962, 1978), Niskanen (1971) and Tullock (1967, 1976). A central assumption in public choice theory of regulation is that politicians and government officials, like any other individuals, are self interested and rational in their pursuit to maximize their own utility. Among other issues, public choice theorists also sought to develop a theory of special interest groups and regulation (Parker, 2001), heavily influenced by Olson's theory of groups and collective action (1965). In line with the public choice theories of regulation, the 1970's and 80's were marked by the development of the *regulatory capture* theory of regulation in the political economy field. The central argument of the *capture* theory is that regulation is captured by the special interests of the regulated parties and, therefore, fails to consider the general interests of society at large. In essence, regulators and legislators obtain political resources (votes or profits) through the supply of wealth transfers to special interest groups (DiLorenzo, 1988). There is a tradeoff between consumer and producer interests, and interest groups compete against each other to determine economic regulation in the industry which they are a part of (Tollison, 1998).

Stigler (1971) was the first to develop a theory of economic regulation and to introduce the *capture* theory argument. Concerned with how the benefits and burdens of regulation are allocated, how regulation is designed and the impacts of regulation on resource allocation, he proposed a scheme to analyze the supply and demand for regulation. The major hypothesis in Stigler's theory is that special interest groups use the coercive power of government to shape laws and regulations to their own benefit. He draws on Olson's (1965) theory of collective action to argue that special interest groups (i.e., producer groups) will be more effective than consumer groups in influencing regulation because of their ability to organize and persuade regulators. The process, however, is not costless. On the supply side, regulators seek to obtain votes and resources (campaign contributions, bribes, etc) in order to favor special interests in the definition of regulation.

Posner (1974) questioned the adequacy of both the public interest and capture theories of regulation. He presented criticisms regarding the assumptions and concepts embedded in these theories, but focused mainly on the capture theory. He concluded that: "Neither theory can be said to have, as yet, substantial empirical support. Indeed, neither theory has been refined to the point where it can generate hypotheses sufficiently precise to be verified empirically" (Posner, 1974, p. 356). However, Posner presents an optimistic view of the economist's theory of regulation. He proposes that the general notion of human behavior as being driven by self interested individuals in economics has much potential when applied to the political process.

Intrigued by Stigler's interest group theory and by Posner's criticism of the theory, Peltzman (1976) sought to formalize and extend it, by providing a deeper analysis of the supply side of the equation. He proposed that regulation is merely a process of wealth transfer and questioned Stigler's notion that producer groups always win and consumer groups always lose. He proposed reasons why regulators might favor consumer groups over producer groups, even though the latter lobby better. Legislators above all wish to maintain office and their support for consumer or producer groups will be determined by the amount of political support they receive from each. Peltzman's model, therefore, presents a formal and more balanced way of analyzing the supply and demand for regulation. He proposes that legislators seek to maximize their political support by finding the equilibrium point between marginal political costs and marginal political gains when making regulatory decisions.

Motivated by Stigler, Posner and Peltzman, Becker (1983) sought to develop a theory of competition among pressure groups for political influence. He wanted to understand how interest groups compete among themselves for political influence, rather than how they interact with legislators, politicians and voters. The former are assumed "mainly to transmit the pressure of active groups" (p. 372). The central idea in Becker's model is once again inspired by Olson's logic of group behavior; pressure groups will determine their optimal amount of expenditures (time and money) with lobbying for political influence given the amount of pressure applied by other groups. The size of the groups and their ability to avoid free riders will influence the amount of

pressure applied by each group. Because these groups lobby for subsidies or against taxes, competition among them will result in "the equilibrium structure of taxes, subsidies, and other political favors" (p. 372). Also, governments will seek to minimize deadweight losses of redistributive policy when considering pressure group influence. Furthermore, Becker argues that, unlike previous hypotheses by other political behavior models, there is no group that completely wins or loses because of the dynamics of the process: "heavily taxed groups can raise their influence and cut their taxes by additional expenditures on political activities" (p. 372).

In parallel to the development of the previously analyzed theories was a small body of literature concerned with the social costs of lobbying for beneficial regulation and legislation, or what became known as "rent seeking" behavior. Although the term was coined by Krueger in her 1974 paper, Tullock (1967) was the first to introduce the concept. Krueger (1974) sought to develop a model to show the costs involved with competitive rent seeking by analyzing the costs incurred when groups compete for import licenses. Her central hypothesis was that "competitive rent seeking for import licenses entails a welfare cost in addition to the welfare cost that would be incurred if the same level of imports were achieved through tariffs" (p. 295). She concluded that the welfare costs of import licensing are greater than the welfare costs of a tariff equivalent due to the resources that are allocated in competition among groups for the licenses. However, despite Krueger's seminal work, there is still widespread

disagreement in the literature on the dimensions and impacts of the costs of lobbying in real economies.

A last section of the relevant literature relates to the behavior of interests groups and the process through which they seek to influence regulation. Such research has developed more recently with significant contributions from New Institutional Economics (NIE) scholars. Spiller and Liao (2008) summarize such contributions to emphasize the importance of understanding the role interest groups play in the policy making process and the effects of the institutional environment they operate in on their activities. The authors make an important point related to the structure of the American political system and how laws are created and implemented. They argue that although laws are enacted by the legislative branch, it is the bureaucratic agencies of government that make and implement most policies. Such system creates incentives for groups that are affected by legislation to try to control or influence policy creation and enforcement. Spiller and Liao state that generally interest groups seek to influence and control policy through three kinds of activities: buying influence, lobbying for influence (in the sense of providing information to decision makers) or suing for influence. All these can be achieved through legal and/or illegal actions and in direct or indirect forms. The authors argue that interest groups make strategic choices of influence "instruments" according to the incentives provided by the institutional environment.

Furthermore, Spiller and Liao (2008) argue that the separation of powers in the American political system encourages transparent and direct participation of interest

groups in policy making. Legislators benefit from interest group activity in that it reduces the information asymmetry between legislators, regulators and private interest groups. Congressmen in the US stay in power enough time to invest in specialized legislative skills, and to play an active role in policy making, while overseeing the bureaucratic agencies that actually implement policies. The central conclusion of this research and the main policy implication is that "interest-group regulatory reform must take the institutional environment into account in order to be successful in delivering the expected effects of increased transparency and improved public policy" (p. 326).

In sum, it becomes clear that there is agreement among scholars who have studied the theory of regulation that private interest groups play a large role in influencing regulation and that their rent seeking behavior not always generates optimal or efficient social welfare outcomes. No such agreement exists on the idea that private groups always win and the general society interests always lose. On the demand side, it is less costly for private interest groups to organize to influence regulation than it is for public interest groups. However, on the supply side politicians, above all, seek to maximize their political profits and maintain office, which would lead them to favor majority voters in eventual circumstances. The most important conclusion, however, remains that private interest groups compete for political influence to achieve favorable regulation and legislation and that process has welfare implications for society. Politicians respond to the demand for favorable regulation by receiving political favors and other forms of political profit.

Furthermore, interest group activity is encouraged in the United States due to the separation of powers in the American political system. Interest groups seek to influence policy and regulation using different "instruments" and through all government branches. However, because the "fine print" of policies and regulation is written and implemented by bureaucratic agencies of government, their efforts are more likely to be channeled to this level.

3.2. Political entrepreneurship theory of regulation

The literature on political entrepreneurship has grown in the past years, highly influenced by the development of the theory of entrepreneurship. Most studies in entrepreneurship focus on self-employment as the essence of entrepreneurial activity and what signifies the entrepreneur as a market actor (see e.g. Parker, 2004). This type of occupational view of entrepreneurship as demonstrated through firm startups and self-employment (Klein, 2008) clearly suggests that novelty is at the core of what constitutes entrepreneurial action. In this regard, it is similar to Schumpeter's (1934) focus on innovation, seen as the creation of new combinations of inputs as the core of the entrepreneur's contribution in the market place. The field of entrepreneurship is characterized by the emphasis on novelty and creation (see e.g. Kirzner, 1973), which in the occupational studies of entrepreneurship emerges as very concretely manifested through the creation of a business firm.

The recent literature has focused on different aspect of political entrepreneurship and, although the term has been defined in many different ways, according to Boettke and Coynne (2009), it originated in the work of Dahl (1961), who described political entrepreneurs as political leaders that set the agenda. A large body of the literature describes political entrepreneurs as drivers of positive changes in the flow of politics or institutions (e.g., Schneider and Teske, 1992; Schneider and Teske, 1993). For the purpose of this particular study, a political entrepreneur is defined as an individual or interest group that identifies a political profit opportunity and acts on it (Holcombe, 2002). These groups or individuals lobby government for beneficial regulation and privileges (Wagner, 1966) that result in policy, politics or institutional changes (Sheingate, 2003). Like interest groups, such political innovators are driven by rent seeking behavior – that is, they seek to extract political profits by taking advantage of opportunities to influence the political process. Although both the political entrepreneur and the pressure groups take advantage of the coercive power of government to extract rents and increase their own wealth, the nature of these rents is different. The political entrepreneur takes advantage of the political system to create new rents, while interest groups take advantage of the system to influence the allocation of those rents after they have been created. The articles reviewed below are those that in some way relax the boundaries of the political entrepreneurs beyond politicians and bureaucrats, to include private interest groups.

Baumol (1990) challenged the common theory that the supply of entrepreneurs affects the economic growth of a society. He argued that entrepreneurs are always present and that their entrepreneurial efforts will not always be directed towards constructive activities. Baumol proposed an extension of the Schumpeterian model of entrepreneurship. He argued that, although Schumpeter characterized innovations as more than just technological improvements, he failed to consider that there may be unproductive forms of entrepreneurship, such as rent seeking and organized crime.

> If entrepreneurs are defined, simply, to be persons who are ingenious and creative in finding ways that add to their own wealth, power and prestige, then it is to be expected that not all of them will be overly concerned with whether an activity that achieves these goals adds much or little to the social product or, for that matter, even whether it is an actual impediment to production. (Baumol, 1990, p. 898)

Therefore, what matters is not the supply of entrepreneurs, but the relative payoffs provided to the entrepreneurs for directing their efforts to productive or unproductive entrepreneurial activities. He proposed that it is the rules of the game or institutional arrangements in a society that determine the intensity and allocation of entrepreneurial efforts between productive and unproductive activities. Although Baumol does not specifically talk about political entrepreneurship or state political entrepreneurship as an unproductive entrepreneurial activity, it seems reasonable to assert that the concept presented by him fits well to the general idea behind the term. However, it cannot be affirmed that all forms of political entrepreneurship are destructive or unproductive. There is widespread disagreement in the literature on whether political entrepreneurship is good or bad for societies and for economic development.

Holcombe (2002) argues that political entrepreneurs can allocate resources toward productive or predatory political profit opportunities. The difference between the two lies in the way that the political profits are originated. Productive opportunities originate from identifying and eliminating inefficiencies in the government system or process. Predatory opportunities originate from the use of the coercive power of government to transfer wealth from one group to another. The welfare effects of political entrepreneurship, therefore, can be positive or negative, depending on the actions taken by political entrepreneurs. The author argues, however, that democratic governments tend to favor predatory over productive political entrepreneurship because of the redistribution incentives they provide. Political entrepreneurs profit more from predatory entrepreneurship than from productive entrepreneurship. Predatory profit opportunities will always exist because political support is more heavily weighed than economic efficiency and because the government has coercive power.

The efficiency of political exchange and the idea proposed by Becker (1983) that legislators respond to interest group demands in a way to reach the equilibrium point between marginal political benefits and marginal political costs is assumed away because of the transaction costs involved in the process. The transaction costs of expressing political demand are high for many individuals. In a market, anyone can voluntarily choose to participate in an exchange, and will usually do so only if they have enough information about the issue and about what is at stake. In politics, however, because the government has the power of coercion, individuals or groups of individuals

who would not chose to participate in a certain exchange (because they do not have enough information to make a decision or to have a stake in the issue) are forced to do so. Those who do have information can take advantage of it to their own benefit. Therefore, according to Holcombe (2002), resource allocation through politics cannot be as efficient as resource allocation through markets.

> In markets, the incentive structure is such that people have the incentive to seek out opportunities for more efficient resource allocation, whereas in democratic politics, the institutions give political entrepreneurs the incentive to seek out opportunities for predatory and inefficient policies. It is not just that the invisible hand does not pull quite as hard toward efficiency in politics, but rather that in politics the incentives pull toward inefficient resource allocation. (Holcombe, 2002, pp. 156-157)

DiLorenzo (1988) sought to apply Austrian school insights into public choice theory and emphasize the role of the political entrepreneur. He argued that because economists in the public choice field have relied on neoclassical economics tools to analyze the dynamics of political systems and political behavior, the results of such analysis may be flawed. The static equilibrium property of neoclassical price theory has been widely criticized by Austrian economists, who view competition as a dynamic process. Although public choice scholars have considered the innovative and wealth creating role that entrepreneurs play in private markets, they have failed to recognize the destructive effects of politics due to rent seeking behavior of political entrepreneurs. “The essence of political entrepreneurship is to *destroy* wealth through negative-sum rent seeking behavior” (p. 66). Furthermore, the interest group theory is criticized for assuming that

regulators and legislators, like profit maximizing firms in perfectly competitive markets, respond to interest group demand for wealth transfers.

> But the price theory analogy is not entirely accurate, for in a world of uncertainty, producers are constantly searching for and *creating* profit opportunities by advertising, offering new or different products, and other activities aimed at stimulating the demand for their goods and services (DiLorenzo, 1988, p. 66).

Political entrepreneurs, therefore, play a larger role than just *legislation brokers*. They seek to create and induce the "demand for their services, i.e., the provision of wealth transfers" (p.66).

A more positive view of the political entrepreneur is provided by Sheingate (2003) who sought to explore the relationship between institutional change and political entrepreneurship. Sheingate was concerned with the role of the entrepreneur, the nature of entrepreneurial behavior and with the structural characteristics that influence entrepreneurial behavior. He suggested that entrepreneurs take advantage of moments of "instability, or speculative opportunities for innovation" that "challenge existing boundaries of authority" (p.190). Also, he proposed that such innovations consist of recombining existing resources. His most relevant insight was that political entrepreneurs are able to transform their creative acts into long lasting institutional change because of "the speculative opportunities of decision-making under uncertainty, the resources provided by multiple, overlapping, heterogeneous structures, and the flexible assets afforded by ambiguity" (p. 202). Therefore, Sheingate suggests that political entrepreneurs can be an endogenous source of institutional change. This

challenges the mainstream idea of exogenous shocks that disturb equilibrium and suggests a more dynamic approach, where politics and political actors can play a significant role in promoting institutional change.

Political entrepreneurs, therefore, are like any entrepreneur: they seek to increase their wealth or utility through the recognition of opportunities for innovation. However, in politics, because of the coercive power of government and the institutional design of the democratic system, political entrepreneurs have perverse incentives to engage in unproductive entrepreneurial activities, such as rent seeking, rather than productive ones. The influence political entrepreneurs exert on the government can translate into institutional change itself, but likely in a way that is not beneficial for society as a whole. Political entrepreneurs, therefore, whether they are public or private figures will do more than just influence regulation or promote institutional change, they will search for opportunities to provide wealth transfers.

3.3. Analysis and contrast of theories

The theories of political economy and political entrepreneurship as presented above are both set to understand interest group behavior and competition. Both of them are derived from the notion that individuals and interest groups are self interested and engage in rent seeking behavior to capture gains from changes in politics and regulation. The motivation for their development, however, is different. The study of economic regulation using political economy theory was triggered mainly by the

question of why inefficient policy is created and remains in place. This central question inspired scholars to develop a theory of competition among private interest groups for favorable regulation. The development of the theory of political entrepreneurship, as previously mentioned, was motivated by the theory of entrepreneurship. The notion that entrepreneurial efforts can be directed towards productive activities as well as unproductive activities (such as rent seeking), especially in politics was the basis for such theory. Understanding the entrepreneurial behavior and institutional incentives that drive politicians or private interest groups to engage in unproductive activities was the main driver of the analyzed literature. On the surface, these theories seem to target the same issue, although for different reasons. However, my objective is to point out differences in the objectives and the roles that actors play in both cases and to suggest that these theories are complementary instead of mutually exclusive. Therefore, they can be used in combination to inform the biofuels regulation questions proposed in this study.

It is clear that the motivations for the development of the two theories are different. However, the main difference between them, and also the most informative when thinking about the biofuels market and the objective of this study, relates to the role that actors play in influencing regulation. Specifically, how is the role of the political entrepreneur different from the role of the competitive interest group?

The political entrepreneur, like the common interest group, will take advantage of political profit opportunities to extract rents by producing political influence.

However, the political entrepreneur will do so by exploiting moments of instability and uncertainty that create opportunities to promote long lasting institutional change. They play a role in the process of drafting legislation and, therefore, can make the rules of the game to their favor. Political entrepreneurs, in this sense, create new rents by producing influence. Such rents are created through institutional innovation and the realization of long lasting changes in the rules of the game. These changes can have negative or positive social effects depending on the motivating forces and incentives the entrepreneur faces to promote such change. As stated in the literature, the political entrepreneur can engage either in opportunities to correct for market failures and inefficiencies in the government process, which are beneficial for society, or in political rent seeking opportunities, which have destructive effects for society welfare. However, the redistributive and coercive natures of government provide strong incentives for political rent seeking by interest groups.

It becomes clear from the analysis above that, although both the political entrepreneur and the pressure groups take advantage of the coercive power of government to extract rents and increase their own wealth, they do so for different reasons and in different stages of the process. This notion is comparable to that of the business life cycle, first developed by Vernon (1966) to explain the patterns of international trade. A business firm or an industry evolves through common phases that are known as introduction, growth, maturity, and decline. The entrepreneur plays the role of the innovator and earns profits by making correct investment decisions and

overcoming the uncertainties of this initial stage of creation. As the uncertainties are reduced, competition arises and profit opportunities begin to decline. Rapid growth moves the market to the point of saturation and, eventually decline (Mueller, 1972).

The roles played by political entrepreneurs and interest groups follow the same pattern. The political entrepreneur's behavior is driven by the realization of an opportunity to create new rents in moments of instability and uncertainty. Interest group behavior is motivated by the realization of existing rents and through recognizing the opportunity to gain a share (or a greater share) of those rents by producing political influence and taking advantage of the system.

In the political economy literature, interest groups produce political pressure to influence existing regulation and maximize their incomes subject to other groups' pressure. They optimize their income (benefits) subject to the expenditures (i.e., time, energy and money) of lobbying to them and on the amount of pressure expended by other groups. The rents already exist and their choice is based on the benefits they derive from trying to gain a greater share of such rents.

Therefore, my first hypothesis is that pressure groups will compete for rents that have been created by political entrepreneurs, who recognized in a moment of uncertainty and instability the opportunity to transfer wealth from one group to another by promoting institutional change.

However, if the hypothesis that the political entrepreneur creates new rents holds true, we must ask the question of what will happen to him once he has created

these rents. It is not likely that he will "disappear". Once rents have been created and other groups start competing for them, the political entrepreneur will play the same role as other groups, but perhaps with some kind of "first mover advantage" because of their influence on Congress, where legislation is enacted, and their role in drafting new legislation in the first place. In other words, do political entrepreneurs have a first mover advantage when they become an interest group competing for the re-allocation of the rents created by them?

Therefore, my second hypothesis is that political entrepreneurs have a first mover advantage when they become a competitive interest group because of their role in drafting the legislation and because of their influence on the legislative branch.

Considering the discussion above, it is important to further understand the implications for behavior of the actors in the two theories and the way they exercise influence in the different stages of the process (i.e., creating rents and re-allocating rents). In other words, how do the different roles of political entrepreneurs and interest groups affect the allocation of their efforts towards different government branches?

In the political economy literature, especially among the studies done by NIE scholars on interest groups, it becomes evident that the role interest groups play in policy making in a given country is related to the institutional structure of politics in that country. The separation of powers in the United States political system encourages transparent and direct interest group participation in policy making. The legislative branch enacts vague laws that are translated into policies by the bureaucratic agencies

of the executive branch. Although the legislators oversee the creation and implementation of policies, it is the regulatory agencies that write the fine print of the rules that are likely to affect interest groups. Therefore, interest groups will seek to influence decision makers in all three possible branches (legislative, executive, and judiciary). However, according to the literature, most commonly they seek to influence the regulators (executive branch) since the general laws passed by the legislative branch are vague and the judiciary system is used as a last resource.

In the political entrepreneurship literature, the government is treated as one big unit, and no distinction is made between branches. Consequently, no evidence is presented to indicate what level of government political entrepreneurs use to influence decision makers or even what levers of influence they use. The political economy theory of interest groups is far more developed in that sense. However, if political entrepreneurs are "creators" of new rents, or drivers of lasting institutional changes, their main lever of influence is likely to be the legislative branch. Because the legislative branch is responsible for passing new laws and the political entrepreneur is more concerned with promoting a long lasting change, we could expect the political entrepreneur to be less concerned with the fine print. If the above hypothesis and discussed relationships hold true, political entrepreneurs will influence the way the law is written, and the quantity of rents that will exist from the creation of artificial markets. Interest groups will be more concerned with the fine print, since they will likely influence the re-allocation of the rents created by the political entrepreneur. The

effective effort of each group in influencing different levels of government will determine the marginal profitability of institutional change from affecting each level.

The third hypothesis, therefore, is that the effective effort of each group in influencing different levels of government is dependent on the role they play in the creation of new rents or competition for existing rents, and will determine the marginal profitability of institutional change from influencing each level of government.

To formalize these notions assume that the profitability of institutional change for each individual group π is a function of influence on the legislative branch λ, influence on regulators (executive branch) β and influence on courts (judiciary branch) x at a given time t and of the effective effort e of each interest group i. Therefore:

$$\pi(\lambda_t, \beta_t, x_t; e_i)$$

Therefore, for the political entrepreneur at the time of rent creation t_1, the marginal profitability of influence on the legislative branch would be greater than any other branch due to the marginal effectiveness of the political entrepreneur's efforts (e) in influencing legislators as opposed to regulators or courts.

$$\frac{\partial \pi}{\partial \lambda}\frac{\partial \lambda_{t1}}{\partial e_i} > \frac{\partial \pi}{\partial \beta}\frac{\partial \beta_{t1}}{\partial e_i} > \frac{\partial \pi}{\partial x}\frac{\partial x_{t1}}{\partial e_i}$$

At time t_2, *ex post* the creation of rents, the political entrepreneur will compete with other groups to influence the re-allocation of those rents. The marginal profits and the effectiveness of the efforts from influencing one government branch versus the other may shift. However, at the margin the political entrepreneur may still have a favorable position in influencing the legislative branch due to their original role. The political

entrepreneur himself might continue to direct efforts towards influencing the legislative branch. However, we could expect that they would also find other levers of influence, such as coalitions, to compete with other interest groups.

The competitive interest groups will seek to influence the re-allocation of the rents created by the political entrepreneur. Therefore, for the interest groups competing for the rents at time t_2, the marginal profitability of influence on the regulatory agencies or the courts would be greater than the legislative branch due to the role they play in re-allocating existing rents and not creating new rents. Their marginal profitability of influencing the regulators or the courts would depend on the effectiveness of their efforts to influence one or the other.

$$\frac{\partial \pi}{\partial \beta}\frac{\partial \beta_{t2}}{\partial e_i} > \frac{\partial \pi}{\partial x}\frac{\partial x_{t2}}{\partial e_i} > \frac{\partial \pi}{\partial \lambda}\frac{\partial \lambda_{t2}}{\partial e_i}$$

In summary, I have proposed that the interest group theories of political entrepreneurship and political economy differ in the role that the actors play in influencing regulation. Based on the analysis of the two theories, I have raised three questions and three hypotheses, which are re-stated below. The questions and hypothesis are all connected and the last two are dependent on the first. Therefore, if the first hypothesis is rejected, the second and third will also be rejected.

Question 1: How is the role of the political entrepreneur different from the role of the competitive interest group?

Hypothesis 1: Pressure groups will compete for rents that have been created by political entrepreneurs, who recognized in a moment of uncertainty and instability the

opportunity to transfer wealth from one group to another by promoting institutional change.

Question 2: Do political entrepreneurs have a first mover advantage when they become an interest group competing for the re-allocation of the rents created by them?

Hypothesis 2: Political entrepreneurs have a first mover advantage when they become a competitive interest group because of their role in drafting the legislation and because of their influence on the legislative branch.

Question 3: How do the different roles of the political entrepreneur and interest groups affect the allocation of their efforts towards different government branches?

Hypothesis 3: The effective effort of each group in influencing different levels of government is dependent on the role they play in the creation of new rents or competition for existing rents, and will determine the marginal profitability of institutional change from influencing each branch of government.

4. Research Methods and Data

The research topic presented in this study is qualitative in nature, since its primary motivation is to understand the actors that shape biofuels regulation in the US and the different roles they play in doing so. The first issue considered when determining the research method to be used in achieving the research objectives was the type of research questions being asked (Yin, 1994). According to Yin (1994), questions that are motivated by understanding "how" or "why" certain phenomenon have occurred call for descriptive research methods that are based on multiple sources of evidence. Among these more explanatory methods are case studies, histories or experiments. The case study method was chosen over the other two due to the contemporary nature of the issue and the possibility of conducting interviews and direct observation (which excludes the history method) and the inability to control behavioral events (which excludes the experiment method).

Case studies have been used for research in many disciplines such as political science, business, and sociology. In economics, there is high level of criticism and disregard for case studies, mainly due to generalization and bias concerns (Yin, 1994; Alston, 2008). These are valid concerns that should be taken into account when selecting case studies, but also when using any alternative research method. It is

important to recognize, as mentioned earlier, that generalizations in case studies are analytical, as opposed to statistical (Yin, 1994).

In the NIE literature, case studies have been used extensively. NIE scholars advocate case studies because they allow a more detailed and more compelling analysis of "both the determinants and consequences of institutions and institutional change" (Alston, 2008, p. 103). According to Alston, the combination of analytical narratives (or case studies) provide useful insight for more general theory building, especially when it comes to complex issues, such as institutional change.

According to Yin (1994), a well crafted case study is as good of a research tool as any other, especially when it comes to contemporary issues that are highly dependent on the context in which they are taking place and where behavioral events cannot be controlled. Also, case studies serve as useful tools when research is explanatory and requires an understanding of a sequence of linked factors that have occurred over time (Yin, 1994). An important issue is to construct the case based on multiple sources of evidence that converge in a triangular form (Yin, 1994; Eisenhardt, 1989).

Although biofuels have been used for many years as a source of fuel, its regulation and increased popularity, especially as a topic of economic research, are contemporary issues. The current state of the regulatory environment is a consequence of the actions and roles played by the relevant actors (who will be identified in the case). The reviewed literature provides evidence to support such statements since it becomes clear that policies that have negative welfare effects for society are created

and persist due to private forces influencing the political system. Also, the actors are motivated to engage in rent seeking behavior by the institutional design of the political system itself, which does not allow for a clear distinction of the boundaries between the context and actual phenomenon. Therefore, a descriptive analysis and timeline of the biofuels regulatory process, as well as insight from interviews with interest groups that have a stake in the process will inform the questions and hypotheses set forth in the previous section. Also, they may serve as base for a more general and concrete development of a theory linking the roles and behavior of political entrepreneurs and common interest groups.

The case study was built based on two mains sources of data: interviews and documents. The documents used to build the case consist of presentations, studies, media clippings and videos, and official government reports. Caution was taken when analyzing these documents to recognize any biases that their authors may have. The utilized documents are presented in the case study database in appendix 1.

Interviews were conducted in Washington DC, due to the political nature of the topic. Most actors involved in the biofuels regulation issue are located or have offices that deal with political issues in Washington DC. The interviews were very informal and based on an open ended set of key questions. The questions were, above all, used as a guiding tool to support an informal conversation, where the interviewed parties were asked to express their opinions on the topic. The interviews were conducted to understand the levers of influence used by interest groups to influence regulation of the

US biofuels market and to understand the roles played by the actors involved in the biofuels regulatory process. Although the focus of the project is on biofuels regulation, insights on how interest groups influence regulation in general were welcome, mainly because many of the interviewed parties were involved in more than just biofuel lobbying activities or regulatory issues.

The interviews were not recorded due to the nature of the activities of the interviewed parties. The primary data collected through the interviews were in the form of written notes taken during the interviews. Although this measure was taken to address omission bias on the part of the interviewees, it inevitably introduced some level of selection bias in the data, because the notes from the interviews were based on my selection of what information was relevant and what was not. Also, the data reflect the opinion of individual members of the interviewed groups, which could also be a source of bias. The effect of any such bias is minimized through the use of secondary sources of data.

The choice of the interviewed parties was first made based on the construction of a map of interests and influences in the biofuels regulation issue in the US. The interests were identified and classified in groups according to table 1 below:

Table 1: Interest group classification

Primary Interest Groups		
Group A	Corn ethanol	Coalitions that represent corn ethanol producers.
Group B	Corn producers	State and national level coalitions of corn producers.
Group C	Sugarcane ethanol	Organizations that represent sugarcane ethanol producers.
Group D	Corn users	Coalitions that represent food and livestock producers.
Secondary Interest Groups		
Group E	Advanced biofuels	Coalitions that represent producers and developers of advanced biofuels or biofuel technologies.
Group F	Environmental groups	Organizations that promote and advocate for energy policies that are environmentally friendly.
Group G	Oil companies	Coalitions that represent oil producers.
Group H	Auto/Marine industry	Coalitions that represent auto and marine manufacturers.
Indirect Interest groups		
Group I	Gov. affairs consultants	Consulting companies that specialize in "effective lobbying" activities and government affairs.
Group J	Industry coalitions	International industry coalitions that promote trade and investment between countries and provide input into policy.
Group K	Policy research centers	Organizations where national and international scholars and "think tanks" provide input for policy based on research, discussion and collaboration.

This classification was used in order to facilitate the organization of the collected information, while preserving the identity of the interviewed parties. The primary interest groups are those that are actively involved in the issue and expend the greatest amount of efforts to lobby for their preferred policy option. The secondary interest

groups have a stake in the issue and are somehow affected by it. Their lobbying efforts and involvement, however, are not as intense as the primary groups. The indirect interest groups are those that do not necessarily have a direct stake in the issue. They may support one of the primary or secondary groups due to ideological factors or because they receive contributions to do so. However, they are generally involved in broad trade and policy issues internationally. A more detailed description of these interest groups, their group objectives and preferred policy options can be seen in appendix 2.

Because the interviews were voluntary and not compensated, and because of limitations of resources to conduct a greater number of interviews, the final selection was made based on availability and willingness of participants during the time I spent at the case study site. I conducted five in depth interviews with organizations from the following groups:

- Group C: one interview.
- Group I: one interview.
- Group J: two interviews.
- Group K: one interview.

Although some key groups were not directly interviewed, I was able to collect much information about their actions and roles from secondary sources of information. These secondary sources also helped validate information obtained about omitted

groups from the interviews. The key questions used to direct the interviews are listed below:

1- In what ways do interest groups provide input for regulation?

2- At what point of the process do interest groups seek to provide input for regulation?

3- Who do interest groups seek to influence when providing input for regulation?

4- How do interest groups coordinate with other organizations or interest groups to influence regulation?

Not all of the questions were applicable to all interviewed groups. The questions were phrased to reflect not only the levers of influence used by the individual interest groups being interviewed, but also their opinions on the levers used by interest groups in general.

In the case of the indirect interest groups, answers are mainly reflective of their views about the levers of influence used by direct interest groups. Their insight was valuable because it provided a more general perspective on the levers of influence used by interest groups to influence regulation.

The questions follow a logical order and the transition from one to the other was, in most cases, natural as the conversation flowed. When the focus of the conversation was lost or in some way becoming lost, I asked a follow up question, usually re-phrasing the question that was being discussed at the moment, to get the interview back on track.

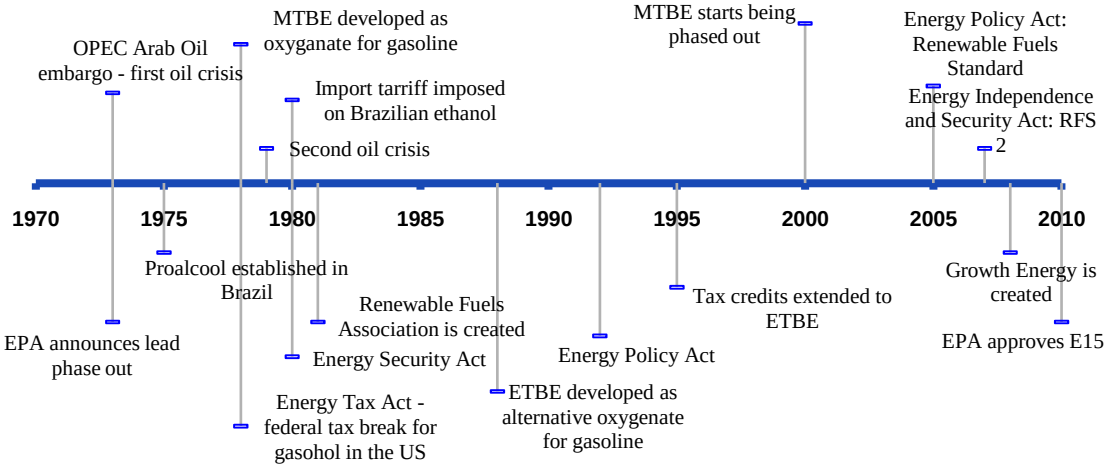
Once the information was collected, it was organized according to group classification and topic, as can be seen in appendix 1. The evidence was brought together in the case study through a narrative analysis of the most relevant events that have occurred in the US biofuels regulatory history. In the case of inconsistencies between sources of evidence, I used the data from the one I considered the most reliable, which could also be a source of bias in the construction of the case. However, I sought to include information that was common among at least two sources of evidence.

5. Case Study

5.1. Biofuels regulation in the US: history and background

As mentioned in the introduction, biofuels have been used as a source of fuel in the US for more than a century. However, the most important developments in the biofuels market, especially regarding corn ethanol, have occurred since the mid 1970's oil crisis, when the industry started being heavily subsidized and regulated by the government. The timeline below summarizes a selection of the most relevant events in the regulatory context of the biofuels market in the US.

Figure 1: Evolution of Biofuels Regulation in the US



Sources: Constructed based on accounts reported by EPA, 2010b; Guertin, 2007; Solomon *et al.,* 2007; Weiss, 1990.

The current state of the biofuels market is reflective of the regulatory marks identified in figure 1. In 1973, the EPA announced the final regulation that would require lead to be phased out from all grades of gasoline due to health concerns. With this regulation in place, the need for alternative octane enhancers for gasoline arose. Furthermore, after the first oil crisis (also in 1973), the US government became concerned with the country's energy supply and began to seek alternative fuel sources to substitute for gasoline and reduce the country's dependence on foreign oil. These two events led to an increase in the demand for alternative fuels and ethanol became an attractive option. However, the cost of producing ethanol was 80 cents a gallon higher than that of gasoline (Weiss, 1990). To make up the cost difference and support the production of ethanol, the government imposed a federal tax break for gasohol (a mixture of ethanol and gasoline) through the Energy Tax Act of 1978.

Energy security concerns increased further after the second oil crisis in 1979, causing the government to pass other bills, such as the Energy Security Act of 1980, which provided loans, loan guarantees and tax benefits for corn ethanol producers (Guertin, 2007; Solomon *et al.,* 2007). Also in 1980, the government imposed an import tariff on foreign ethanol to protect the domestic ethanol industry from competition by less expensive ethanol shipped from countries like Brazil (Guertin, 2007; Solomon *et al.*, 2007). Later in the 1980's, with the environmental impacts of fossil fuels at the center of attention, additives such as methyl tertiary butyl ether (MTBE), which is methanol based, and ethyl tertiary butyl ether (ETBE), which is ethanol based, became popular as

oxygenates for gasoline. MTBE was cheaper to produce than ETBE and was readily available. ETBE was a new product made with 40% ethanol and was expensive to produce. In 1995, the federal tax credit for gasohol was extended to ETBE. Even with the subsidies, the use of MTBE as a gasoline additive was preferred over the use of ETBE (Solomon *et al.,* 2007; Weiss, 1990). In the late 1990's MTBE was found to be carcinogenic. In the year 2000 the EPA announced its decision to phase out MTBE from gasoline. This decision triggered an increase in the demand for ETBE. In 1992, through the Energy Policy Act, the government defined E85 (fuels with up to 85% ethanol blend) as an alternative transportation fuel and required that certain car fleets only purchase flex fuel vehicles that could run on alternative transportation fuels (Solomon *et al.,* 2007).

The federal tax credit for ethanol has been revised and renewed many times throughout the years. It is designed as an incentive for companies to blend ethanol into gasoline. It is currently established as the Volumetric Ethanol Excise Tax Credit (VEETC) at 45 cents for every gallon of ethanol blended into gasoline in the US. The production of corn ethanol is also indirectly subsidized by the secondary 54 cent per gallon import tariff imposed on imported ethanol. This tariff is justified by proponents as a way to keep foreign ethanol producers from collecting the federal tax credit since ethanol from any country can be blended into gasoline. The secondary import tariff was initially established in alignment with the federal tax credit. However, while there have been several re-adjustments to the tax credit (most recently lowering it from 51 cents per

gallon to 45 cents per gallon), the import tariff has remained the same. Despite these subsidies, ethanol production did not grow much until the establishment of the Renewable Fuels Standard, which will be discussed later in this section. Both the tax credit and the import tariff are scheduled to expire on December 31, 2010. National ethanol and corn producers are expending efforts to lobby Congress for the renewal of these subsidies, arguing that they are fundamental for the creation and preservation of jobs and for energy independence and security in the country.

One of the greatest forces in the national ethanol lobby was established in 1981, with the creation of the Renewable Fuels Association. Archer Daniels Midland (ADM) was one of the primary actors in the establishment of the RFA, since ADM produced 75% of the nation's ethanol at that time (Weiss, 1990). In 2008, the corn ethanol lobby was divided, when a group of ethanol producers decided to create Growth Energy. This separation generated conflicts not only within the domestic ethanol industry representation, but also between domestic ethanol producers and corn growers. This event will be discussed in more detail later, as it has great importance in the study of the industry actors and their roles.

Although during the 1990's there were several events that triggered an increase in the demand for ethanol in the US, it was only in the early 2000's that the industry really expanded. According to the RFA, ethanol production increased a staggering 550% between 2000 and 2009 from 1.6 billion gallons to 10.6 billion gallons (graph 1). This increase was mainly due to the MTBE phase out, the establishment of the Renewable

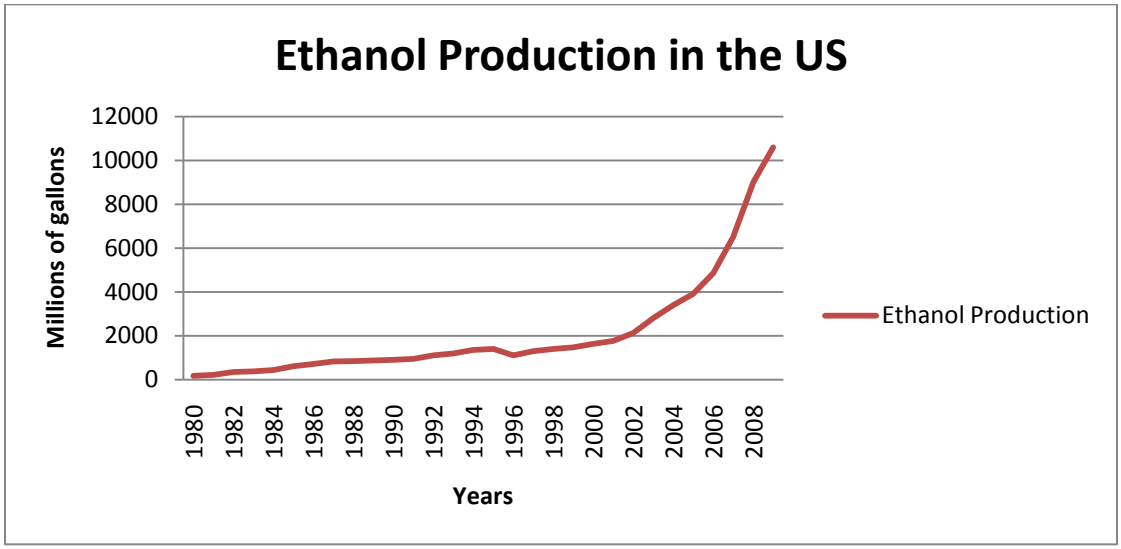
Fuels Standard (RFS) in 2005 and the second version of the RFS (RFS2) in 2007. In 2005, the Renewable Fuels Standard (RFS) was created under the Energy Policy Act to mandate the volumes of renewable fuels required to be blended into petroleum based fuels. The initial volume standards were established at 4 billion gallons by 2006, 1 billion gallons by 2009 and 7.5 billion gallons by 2012[9]. In 2007, a new law revised of the RFS mandates (RFS2). Under the RFS2, renewable fuels volume requirements can be met through using advanced biofuels (cellulosic biofuel, biomass based biodiesel, and sugarcane ethanol) and conventional ethanol (corn ethanol). The mandated volume of renewable fuels in 2010 is 12.5 billion gallons and this volume increases to 36 billion gallons by 2022 (EPA, 2010a).

The amount of ethanol blended into gasoline is constrained by a blend wall, which has been fixed at 10% (E10) for car models 2001 or newer. Since retailers are allowed to produce gasoline-ethanol blends of up to 10%[10], the demand for ethanol is capped by the demand for blended fuel. Current gasoline consumption is not high enough to use all of the mandated ethanol production based on a 10% blend, resulting in excess supply of ethanol[11]. In October 2010, the EPA approved a 5% increase in the allowed quantity of ethanol to be blended with gasoline (E15) for vehicles 2007 or

[9] Available online at: http://www.epa.gov/otaq/fuels/renewablefuels/index.htm.
[10] Note that retailers are allowed to sell E85 (85% ethanol), which is considered an alternative fuel. E85, however can only be used in flex fuel vehicles.
[11] The blend wall constraint exists in the short run because of the limited quantity of flex fuel vehicles in the country. According to the RFA, approximately 6% of passenger cars in the US are flex fuel.

newer.[12] This was triggered by the corn ethanol lobby, especially Growth Energy, which argued that the use of E15 in non flex fuel vehicles is safe and that without such increase it would be hard to achieve the blend volumes mandated by the RFS2 in the next years (Tracy, 2010). The RFS and the blend wall restrictions will be discussed in more detail later on this chapter.

Graph 1: Ethanol production in the UIS



Source: Renewable Fuels Association

In addition to the volume growth, in the early 2000's, the industry also went through a dramatic shift in structure from investor owned firms to producer owned firms. According to Burress and Cook (2009), such a change may have been a result of two factors: "1) state incentives directed at small-scale ethanol processing facilities or

[12] There is much controversy among stakeholders even on whether E10 should be used in older engines. Ethanol (ethyl alcohol) has chemical properties that cause it to be harmful to certain engine parts and vehicles. Alcohols are water soluble and can cause many metallic and non-metallic materials to degrade (Niven, 2005). The use of E15, therefore, has caused even more controversy. The EPA's decision on the approval of E15 for vehicle models produced between 2001 and 2006 is still pending.

those owned by agricultural producers and 2) uncertainty with respect to continued state legislative support" (p. 215). In the 1990's, most of the domestic ethanol output was produced by the four largest firms in the industry. According to Burress and Cook (2009), the industry 4-firm concentration ratio was 73% at the time. ADM alone accounted for 60% of all output capacity (Burress and Cook, 2009). In the early 2000's, triggered by the heavy state and federal support given to new ethanol producers, the volume mandates imposed by the Renewable Fuels Standard, and the MTBE phase out, the number of operating plants boomed, increasing from 54 in 2000 to 187 in 2010 (RFA). Many of these new processing facilities were producer owned, mainly because some states, such as Missouri and Minnesota, had created special programs to support producer owned ethanol operations. In 2007, the industry 4-firm concentration ratio significantly decreased from 73% to 31.5%, and 39% of ethanol output was being produced by producer owned firms (Burress and Cook, 2009).

It becomes clear that in the past ten years the domestic ethanol industry has been growing at a fast pace. Such growth is attributable to the subsidies and volume mandates imposed by the government to support ethanol and to integrate more renewable fuels into the US energy matrix. The recent push by the ethanol lobby to increase the allowed volume of ethanol to be blended with gasoline for non flex fuel vehicles from 15% from 10% is a consequence of such accelerated growth. The supply of corn ethanol has been increasing at a faster rate than the industry can absorb, driving the price of corn ethanol down and increasing the amount of the product that is

exported to countries like Korea (Brasher, 2010). The higher blend of gasoline and ethanol (E15) has been approved by the EPA for newer cars. The corn ethanol lobby has been fighting to expand the E15 approval for all vehicles by arguing that it is a necessary step towards achieving the RFS2 mandate volumes in the next years (Brasher, 2010).

5.2. Biofuels regulation in the US: life cycle analysis

Interest groups have played an important role in the regulatory history of the US biofuels market. All regulatory marks and events identified in the timeline above have occurred partially or entirely because of the influence applied by a series of groups that have a direct or indirect stake in the market. One group, however, stands out: Archer Daniels Midland (ADM), one of the largest agricultural processors in the world, and not surprisingly one of the biggest ethanol producers in the US, has exerted a large amount of influence and power in leading the domestic ethanol industry to where it is today. The role of ADM and other groups will be discussed in detail below. Before doing so, however, it is important to understand the role of institutions and the institutional environment in providing interest groups with so much power and influence.

5.2.1. The American political system

In trying to understand the roles of actors in shaping regulation, I repeatedly identified the political context as an important factor. It is clear that any coercive government system will provide incentives for political rent seeking. Beyond coercion,

however, governments can be structured in ways that encourage or discourage the action of organized interest groups. In fact, lobbying is an illegal activity is some countries (e.g., Brazil). In the Unites States, the structure of the political system is highly conducive and supportive of interest group action (Interview information[13]). Because interest group activity is highly encouraged (Spiller and Liao, 2008), policy making follows a bottom-up, transparent process.

In the interviews I conducted in Washington DC, the structure of the American political system was cited many times as an explanation for the power of interest groups in the US, particularly the farm lobby. The most important characteristic of the American political system, identified by almost all the interviewed parties, is the structure of Congress through Congressional districts. District house representatives allow for policy benefactors to be close to Congress representatives, and, therefore, influence their agenda. There are approximately 42 Congressional districts in the Corn Belt region[14] of the US, which represent almost 10% of the total number of US Congressional districts (National Atlas, 2010). The significant representation of Corn Belt district Senators allows the corn ethanol lobby to exert a high level of influence on agricultural policy and legislation.

Furthermore, according to the interview conducted with a member of Group I (government affairs consultants), the existence of committees and subcommittees to

[13] All references to interview information in this chapter are based on interview responses summarized in tables 1 – 3 in appendix 1. All the evidence presented in this chapter is available in appendix 1.
[14] The Corn Belt region was identified as western Indiana, Illinois, Iowa, Missouri, eastern Nebraska, and eastern Kansas (Encyclopedia Britannica online: http://www.britannica.com/EBchecked/topic/137792/Corn-Belt).

deal with specific policy issues within the House and Senate is also a powerful tool for private groups to voice their policy preferences and interests: “Interest groups meet with members of the relevant committees and subcommittees to make their case and get the government to work on their behalf”. Senate and House standing committees are permanent and have pre-established responsibilities. Committees are autonomous units that, according to former president Woodrow Wilson, “dominate Congressional decision making” (Fenno, 1973, p. 147). Every new bill introduced to Congress is assigned to one or more standing committees of the House and Senate. The members of the committees are responsible for evaluating and making the decision to pass or not pass those bills. Committee members are chosen based on constituency interests and member’s area of expertise: “members specialize in their committee’s subject matter, and hence that each committee is the repository legislative expertise within its jurisdiction” (Fenno, 1973, p. 147). The House Committee on Agriculture, for example, has approximately eight district representatives from the Corn Belt region, due to the region’s vast interest and representation in the Agricultural Industry (House Committee on Agriculture website). These eight House representatives account for approximately 17% of the committee, which has a total of 46 members. This allows the corn ethanol lobby to work closely with the committees that evaluate the policy issues that are critical to their private interests. They are able to exert a large amount of influence on the decisions of these committees by “making their case” and by providing political contributions to the members of the relevant committees. The relationship between

committee members and political contributions from interest groups in the US biofuels market will be further discussed later in this chapter.

The last important factor cited was the Iowa caucus that happens every two years. In off-presidential election years, the caucus has less importance and impact than when it coincides with presidential election years. Because the Iowa caucus is the first presidential primary in the country, it provides presidential candidates with a first indication of their chances to win the support of voters from other states. The Iowa caucuses receive a lot of media attention, because almost all potential presidential candidates essentially move to Iowa for months to campaign. Iowan voters and interest groups are granted the opportunity to voice their interests and policy preferences to candidates that are seeking their support[15]. Because Iowa is a large agricultural state in general and one of the Corn Belt states, this event provides the corn ethanol lobby with a disproportionate amount of influence on the electoral calendar on presidential election years (Interview, Group J).

> There is little doubt that the first presidential caucus, always in Iowa, has played an important role. Any politicians, be it dogcatcher or presidential candidate, speaking against ethanol in Corn Belt states has been doomed to denigrating letters, jeers from peers, and political obscurity. (Keeney, 2009, p. 9)

According to New York Times article by Alexei Barrionuevo (2006): "With Iowa home to the nation's first presidential caucuses every four years, just about every candidate who visits the state pays obeisance to ethanol".

[15] Information from Iowa caucus website: http://www.iowacaucus.org/iacaucus.html.

5.2.2. Introduction of biofuels regulation in the US

Archer Daniels Midland (ADM) is an agricultural processing company founded in 1902 in Decatur, IL. Besides the company's success as one of the largest agricultural processors in the world, it has been long known for its political clout in Washington DC (Bovard, 1995). ADM has received millions of dollars worth of subsidies from the US government, mainly through the sugar program, the ethanol program and grain export subsidies (Bovard, 1995).

ADM's role in the creation and establishment of the biofuels market is widely documented (Bandow, 1997; Barrionuevo, 2006; Bovard, 1995; Guertin, 2007; Weiss, 1990). When the first oil crisis took place in 1973, uncertainty and instability reigned in the US, as the price of oil increased significantly. The US government, desperate to reduce the country's dependence on foreign oil by finding alternative sources of energy, was the perfect opportunity for ADM's CEO, Mr. Dwayne Andreas. Mr. Andreas, who had well-established political connections due to a close relationship with former Vice President Hubert Humphrey, went to the White House with the 'perfect plan': corn ethanol (Bovard, 1995; Weiss, 1990). According to Keeney (2009):

> In an intensive lobbying and educational effort, the president of ADM, Dwayne Andreas, began to aggressively promote ethanol as an automobile fuel. Andreas convinced politicians such as Senator Bob Dole (R-Kansas) and President Jimmy Carter that ethanol offered a way out of the 1973 OPEC oil embargo that had sent the American economy reeling. (p.9)

ADM was ready to produce corn ethanol, since the already established high fructose corn syrup plants the company owned could be used for processing ethanol as

well (Bovard, 1995; Guertin, 2007; Weiss, 1990). ADM, along with the corn lobby, joined forces to lobby the government to support ethanol, arguing that corn ethanol would be the perfect product to absorb corn surpluses and, especially, to reduce the country's dependence on foreign oil. The cost of producing corn ethanol, however, was high and without government subsidies it would be impossible to produce it at first (Interview information; Bovard, 1995; Weiss, 1990). According to Weiss (1990): "when the first plants went on-line in 1978, wholesale ethanol cost 80-cents-a-gallon more than wholesale gasoline". In order to make up for this difference, the government imposed Federal tax breaks for gasohol through the Energy Tax Act of 1978.

The bill that established federal tax breaks for gasohol producers was introduced and sponsored by Senator Bob Dole, Kansas Republican representative who later became the ranking Republican in the Senate (from 1985 to 1996). He also served as ranking Republican on the Agriculture Committee from 1975 to 1978 and on the Finance Committee from 1979 to 1980. [16] Senator Dole was Mr. Dwayne Andreas' personal friend; they had met in the early 1970's (Weiss, 1990). Mr. Andreas insisted that his relationship with Mr. Dole was personal and not related to business, even though "Senator Dole was ethanol's steadfast sponsor" (Guertin, 2007, p.26).

During his time in Congress, Senator Dole became the chief sponsor of ethanol subsidies (Bovard, 1995; Guertin, 2007; Weiss, 1990). He was a farm-state Senator and had his own interests in supporting corn ethanol. However, throughout his political

[16] Genuine Kansas: famous Kansans: http://www.genuinekansas.com/famous_robert_j_dole_us_senator_kansas.htm.

career, Senator Dole received generous contributions from Mr. Andreas, his relatives and ADM (Guertin, 2007; Weiss, 1990). According to Guertin (2007), “donations to Senator Dole included: $200,000 to two campaigns, $275,000 to the Dole Foundation, and $500,000 to the Red Cross when Elizabeth Dole took heed of the organization” (p. 26). Such contributions were not limited to Senator Dole. By 1990, ADM, Andreas and his relatives had provided over $4 million in political contributions to individual politicians, presidential candidates and to both the Democratic and Republican parties (Bovard. 1995; Weiss, 1990). According to data from the Center for Responsive Politics (table 2), since 1990, ADM has provided over $8.5 million in political contributions to politicians from both the Republican and Democratic parties. This value is significant considering, for example, that Exxon Mobil, one of the largest oil and gas companies in the world, has contributed approximately 11.4 million during the same time period between 1990 and 2010 (Center for Responsive Politics, 2010).

Table 2: ADM political contributions

Election cycle	Total ADM Contributions	Democrats	Republicans	% Dem	% Rep
1990	$ 311,425.00	$172,500.00	$138,925.00	55%	45%
1992	$ 1,530,425.00	$455,100.00	$1,075,325.00	30%	70%
1994	$ 1,096,503.00	$677,270.00	$418,733.00	62%	38%
1996	$ 1,003,451.00	$467,650.00	$535,801.00	47%	53%
1998	$ 759,525.00	$389,525.00	$370,000.00	51%	49%
2000	$ 950,650.00	$419,450.00	$528,700.00	44%	56%
2002	$ 1,970,060.00	$733,810.00	$1,236,250.00	37%	63%
2004	$ 104,125.00	$42,400.00	$61,725.00	41%	59%
2006	$ 163,850.00	$69,200.00	$94,650.00	42%	58%
2008	$ 337,600.00	$179,300.00	$158,300.00	53%	47%
2010	$ 281,559.00	$150,000.00	$131,250.00	53%	47%
Total	**$ 8,509,173.00**	**$3,756,205.00**	**$4,749,659.00**	**47%**	**53%**

Source: Center for Responsive Politics (2010).

The contributions listed above include donations from ADM's Political Action Committees, individuals and soft money[17] from individuals and organizations. Not surprisingly, Dwayne and Inez Andreas hold the title of ADM's top individual contributor while affiliated to the organization (Center for Responsive Politics, 2010). Mr. Andreas was ADM's CEO from 1971 to 1997. According to Bovard (1995), Dwayne Andreas was the most important figure in ADM's history of obtaining corporate welfare. The Federal tax breaks granted to gasohol producers are largely attributed to the efforts exerted by ADM and Mr. Andreas to promote the production of corn ethanol. Many critics have cited the tax breaks as nothing more than "corporate welfare for ADM" (Weiss, 1990). Bovard (1995) concludes that: "ADM's lobbying and campaign contributions have

[17] Soft money is a type of contribution that can be used by parties to support "party activities," but not federal candidates.

certainly been the key force in creating and perpetuating federal ethanol subsidies" (p. 35).

5.2.3. Industry development

After the second oil crisis in 1979, energy security concerns continued to haunt the country, along with a growing concern for the environmental impacts of fossil fuels. The government promoted the use of ethanol and methanol as gasoline alternatives, although methanol producers received no subsidies. With the domestic ethanol industry expanding, ADM continued to lobby government for beneficial legislation. From 1980, the Energy Security Act provided loans, guarantees and tax incentives to support the construction of new ethanol plants and promote the industry's growth. Later in 1980, Senator Dole introduced to Congress the bill that would impose an import tariff on Brazilian ethanol (Weiss, 1990). According to Bovard (1995), the tariff was initiated during a luncheon at the White House, where Mr. Andreas and a former ADM lobbyist told President Jimmy Carter that the company would construct a new ethanol plant in Iowa if the government supported its profitability by restricting entrance of foreign ethanol in the US (Bovard, 1995). The 54 cent per gallon import tariff is still in place, but is set to expire at the end of 2010.

In 1981, the Renewable Fuels Association (RFA) was created to represent the corn ethanol industry. The RFA has been long recognized as the lobbying arm of ADM (Interview information; Birger, 2009; Bovard, 1995; Weiss, 1990). RFA duties are

charged based on quantity of ethanol produced and, therefore, ADM, for a long time was the main contributor (Bovard, 1995; Weiss, 1990). As previously mentioned, ethanol production was highly concentrated during the 1980's and 1990's. According to Hendrickson and Heffernan (2002), the concentration ratio of the top four firms in the ethanol industry in 1987 was 73% and this ratio only started to decrease in the early 2000's. ADM produced between 60 and 70% of total ethanol output, followed by other large investor owned firms, such as Cargill (Baker, 2006; Bovard, 1995; Burress and Cook, 2009; Weiss, 1990).

Some sources argue that the relationship between ADM and the RFA goes beyond payment of dues. According to Weiss (1990), the company is the largest funder of an RFA foundation that provides technical information on fuel to the government. Weiss also reported that in 1984, an "invoice from the RFA from William McMurtrie (a former Andreas son-in-law and a lobbyist), requesting a $2,000 fee and reimbursement for a $240.85 dinner with three Congressmen, was forwarded to Archer Daniels Midland for payment" (p. 4). The RFA has played and continues to play a key role in supporting the ethanol industry and in lobbying the government to maintain the industry subsidies.

In 1983, Congress enacted the Caribbean Basin Initiative (CBI) to promote development and stability in the Caribbean and Central American regions. Under this initiative, Caribbean products were granted duty free entrance to the US. Caribbean-produced ethanol qualified for duty free entry because more than 35% of the value of the finished product was added by Caribbean producers (Bovard, 1995). ADM, fearing

more foreign competition, took action. “US producers, led by ADM, working through the RFA, engineered an early-morning rule change to strangle any possible foreign competition in the crib” (Bovard, 1995, p. 23). Senator Dole opposed the initial value standards and, in 1986, an amendment of the bill was passed to impose a higher standard (70% instead of 35%) for ethanol from the Caribbean.

In the late 1980’s, with the ethanol tax credit scheduled to expire in 1992, ADM and Mr. Andreas continued to exert pressure on the government to extend it. In November of 1990, Senator Dole blocked Congress action on a steel import bill until his colleagues agreed to extend the ethanol tax credits to the year 2000 (Guertin, 2007; Weiss, 1990). ADM also pressured the government to renew the tax credits by increasing its support to the RFA and the National Corn Growers Association (Weiss, 1990).

Although other interest groups, such as oil companies, and methanol producers were involved in the issue at the time, ADM did not have much competition to worry about. Its biggest concern – Brazilian ethanol – had already been addressed through the protective tariff imposed by the government on imported ethanol. The corn ethanol lobby was growing stronger with the establishment of the Renewable Fuels Association and the increased support of corn farmers. The National Corn Growers Association (NCGA) was a big supporter of corn ethanol because corn producers saw in ethanol a new market for corn (Weiss, 1990). ADM enjoyed a large share of the benefits of the

Federal gasohol tax breaks and other ethanol subsidies since it owned a considerable amount of the domestic output capacity.

In the mid 1980's, with increased pressure from the Environmental Protection Agency (EPA) to completely phase out lead from gasoline, the demand for alternative gasoline additives emerged. The two alternatives at the time were MTBE (which is methanol based) and ETBE (which is ethanol based). MTBE was cheaper to produce and readily available, but was found to be carcinogenic. In the year 2000, the EPA announced actions to "significantly reduce or eliminate use of the fuel additive MTBE and boost the use of safe alternatives like ethanol".[18] According to Bovard (1995), the ethanol lobby, through the RFA, promoted and funded the campaigns and advertisements against MTBE. They also had the support of Democratic Iowa Senator Tom Harkin, who was also a benefactor of Dwayne Andreas' political contributions (Federal Elections Commission, 2010; Bovard, 1995). Senator Harkin later became Chairman of the Senate Committee on Agriculture (from 2001 to 2003 and 2007 to 2009) and is currently a member of the Senate Committee on Appropriations.

With MTBE out of the picture, ETBE became the only alternative. Unlike ethanol, it could be transferred through gas pipelines to gasoline distributors by oil companies. Like ethanol, however, it was expensive to produce. There was a strong movement in the ethanol industry to extend the gasohol tax breaks to ETBE. This movement was led

[18] EPA press release. Available online at: http://yosemite.epa.gov/opa/admpress.nsf/b1ab9f485b098972852562e7004dc686/2054b28bf155afaa852568a80066c805?OpenDocument.

by the Clean Fuels Development Coalition (CFDC) and innitally not endorsed by ADM and the RFA because only half as much ethanol goes into making ETBE as it goes into making gasohol. The CFDC was created in 1988 to promote the development of clean fuels to reduce pollution and foreign energy dependence. Douglas Durante, leader of the CFDC, promoted the expansion of the ethanol industry. The RFA, however, argued against the expansion of the industry. When the CFDC asked Senator Dole to support ETBE, he declined. ETBE however, had unexpected supporters: oil companies, under significant pressure to reduce CO_2 emissions, joined the CFDC and endorsed ETBE. A request to extend the federal tax break was filed as a petition to the Treasury department. An IRS ruling approved the request on the extension of the tax break (Weiss, 1990). Mr. Durante clearly recognized the opportunity to gain a share of the rents created by the ethanol subsidies through ETBE.

In the late 1990's ADM lost both of its strongest forces: Senator Bob Dole left Congress in 1996 and Dwayne Andreas retired in 1997. Andreas's son and heir, Michael Andreas took charge, but had to resign when a lysine price fixing scandal implicated him and other ADM executives. Such events weakened the company's political clout in Washington, although its political preferences regarding ethanol were still represented by the Renewable Fuels Association (Bandow, 1997; Barrionuevo, 2006). The Andreas family remained in the leadership of ADM after the scandal; Mr. Andreas's nephew, Allen Andreas was ADM's CEO from 1997 until 2006.

As the ethanol industry developed, ADM started to experience a higher level of competition and many other interest groups became involved in the ethanol issue. In the early 2000's, the industry concentration ratio had lowered significantly from 73% in 1987 to 49% in 2002 (Hendrickson and Heffernan, 2002). Federal subsidies, along with state level subsidies to support the construction and expansion of ethanol facilities, were promoting a rapid growth of the domestic ethanol industry. One rising star in the ethanol industry was VeraSun Energy Corporation, founded in 2001. By 2008, VeraSun owned 16 plants with an annual capacity of 1.6 billion gallon of ethanol, representing approximately 18% of the total annual industry capacity (Burress and Cook, 2009).

Also, as previously mentioned, in the early 2000's the industry experienced a structure shift from investor owned firms to producer owned firms (Burress and Cook, 2009). POET Energy played a significant role in the expansion of producer-owned ethanol plants. POET was first established in 1991 and specialized in the design and construction of ethanol plants. Currently, the company owns little stake in its ethanol plants, which are mostly owned by farmer-investors. Farmer-investors own shares of the ethanol plants in exchange for the right and obligation to deliver corn to the ethanol plant. POET owns the control rights to most of the ethanol plants and provides a variety of services, including distribution and marketing, to support their network of farmer-investors[19]. The company is now one of the largest ethanol producers in the world. It

[19] For a detailed analysis of the POET model see Burress and Cook, 2009.

operates 27 ethanol plants in the US and produces approximately 1.5 billion gallons of ethanol per year (RFA, 2010).

Although the ethanol industry had developed greatly since its creation in the late 1970's, it was only in 2005, after the establishment of the Renewable Fuels Standard (RFS), that the industry started to experience rapid growth. Biofuels became an attractive market for new entrants and ethanol became the center of many controversies. The first version of the RFS was established under the Energy Policy Act of 2005 and mandated the quantity of biofuels to be blended into gasoline by 2012. The initial volume standards were established at 4 billion gallons by 2006, 6.1 billion gallons by 2009 and 7.5 billion gallons by 2012[20].

The Energy Policy Act of 2005 was sponsored by House Republican representative Joe Barton from Texas[21]. Senator Barton was Chairman of the House Committee on Energy and Commerce when he introduced this bill and currently serves as Republican ranking member on the same committee. He represents an agriculture intensive region of Texas and actively promotes energy security and efficiency through technological innovation and development[22]. The bill was passed after amendments and a committee conference meeting, where members from both the House and the Senate's assigned committees were called to negotiate the terms. Among the members of the conference committee were several Senators that have received political

[20] Available online at: http://www.epa.gov/otaq/fuels/renewablefuels/index.htm.
[21] Congress Library. Available online at: http://thomas.loc.gov/cgi-bin/bdquery/D?d109,d109:3:./temp/~bdh00h:@@@P|/home/LegislativeData.php?n=BSS;c=109|.
[22] Available online at http://joebarton.house.gov/Issues.aspx?section=49.

contributions from ADM, such as Senator Chuck Grassley (R-IA), Senator Baucus (D-MT) and Senator Bingaman (D-MN). Senator Grassley in the second largest recipient of ADM contributions, only behind Senator Phil Hare (D-IL) (Center for Responsive Politics, 2010). Although ADM still owned a large share of ethanol production capacity, many other companies had entered the market and the corn ethanol lobby had gained even more force.

The volume mandates, along with the existing subsidies contributed largely to the industry's growth. By 2005, corn ethanol production had reached 3.9 billion gallons and the number of ethanol plants in the country had doubled when compared to the year 2000 (RFA, 2010). In 2007, the Renewable Fuels Standard was revised and re-established under the Energy Independence and Security Act of 2007. One of the differences between the first and second versions was that the Renewable Fuel Standard 2 (RFS2) distinguished between advanced biofuels and conventional ethanol. To classify renewable fuels into these two categories, the RFS2 also established criteria to measure Greenhouse Gas (GHG) emissions reductions and a methodology to calculate lifecycle GHG emissions (RFA, 2010). The lifecycle GHG emission calculation takes into consideration the indirect land use change (ILUC) impact of producing renewable fuels. ILUC measures the impact of crop-based fuel production on GHG emissions due to expansion of cropland and land conversion (Keeney and Hertel, 2009). To be considered an advanced biofuel, the product should have GHG emissions at least 50% lower than gasoline (EPA, 2010). Corn-based ethanol achieves a 21% reduction

compared to gasoline (RFA, 2010). Sugarcane ethanol achieves a 61% reduction compared to gasoline and, therefore, classifies as an advanced biofuel (EPA, 2010). The volume mandate for advanced biofuels (i.e., cellulosic biofuel, biomass based diesel, and sugarcane ethanol) started at 0.6 billion gallons in 2009 and grows consistently to 21 billion gallons by 2022 (EPA, 2010). The maximum contribution of conventional ethanol (corn ethanol) to the mandate started at 9 billion gallons in 2008 and grows consistently until 2015, when it is capped at 15 billion gallons until 2022.

The classification of sugarcane ethanol as an advanced biofuel in the second edition of the Renewable Fuels Standard was not welcomed by corn ethanol producers. In 2010, when the final implementation rules of the RFS2 program were announced, RFA president Bob Dinneen stated that "Disappointingly, however, EPA continues to rely on oft-challenged and unproven theories such as international indirect land use change to penalize U.S. biofuels to the advantage of imported ethanol and petroleum"[23]. Although the RFA was unhappy with corn ethanol being classified as a conventional biofuel, they still worked closely with the EPA when establishing the volume mandates for both categories. According to RFA press release regarding the final implementation rules for the RFS2, "The RFA has worked tirelessly with Congress and the EPA to not only craft this policy in 2005 and then again in 2007, but to make it a workable program"[24]. The corn ethanol lobby and the sugarcane ethanol lobby are in a constant battle (for

[23] RFA website. Available online at: http://www.ethanolrfa.org/news/entry/rfs-rules-workable-iluc-inclusion-still-problematic/.
[24] Ibid.

some examples see tables 23 and 24 in appendix 1). The sugarcane ethanol lobby, represented by the Brazilian Sugarcane Industry Association (UNICA), promotes a more competitive environment for ethanol in the US, by allowing the federal tax credit and import tariff to expire at the end of 2010. The corn ethanol lobby, of course, promotes the exact opposite.

The Energy Independence and Security Act of 2007 was sponsored by Senator Nick Rahall, along with 198 co-sponsors[25]. The biofuels industry was at the center of attention due to the growing concern to include more renewable fuels into the US energy matrix. Environmental groups, advanced biofuels companies and oil companies were pressuring the government to invest in research and development of second generation biofuels and environmentally friendly sources of energy. The corn ethanol industry continued to expand at a fast rate. In 2007, the number of ethanol plants in the country was up to 110 and ethanol production up to 6.5 billion gallons per year (RFA, 2010).

Considering the above, it is evident that in the current biofuels scene, the main actors are the corn ethanol lobby, the corn producers lobby, and the sugarcane ethanol lobby. Another primary interest group is composed by corn users, mainly led by food and livestock producers (e.g., Grocery Manufacturers Association and American Meat Institute). These groups are at the center of the food versus fuel debate. They argue that the production of ethanol from corn threatens the supply of corn for food and feed and

[25]Congress library. Available online at: http://thomas.loc.gov/cgi-bin/bdquery/D?d110,d110:2:./temp/~bdQJ13:@@@P|/home/LegislativeData.php?n=BSS;c=110|

inflates the price of the commodity. These groups lobby government to allow the ethanol blender's credit and import tariff to expire at the end of 2010 and to subsidize the production and use of second generation, more efficient renewable fuels (see table 25 in appendix 1). Two big allies of the corn user groups are the environmental groups and the auto and marine manufacturers. The environmental groups (e.g., Environmental Working Group and Natural Resources Defense Council) lobby the government against subsidies that support non-environmental friendly products and for the adoption of policies that promote second generation, environmentally friendly fuels (see table 26 in appendix 1). In the biofuels issue, the auto and marine manufacturers are mainly concerned with the adaptability of renewable fuels to the current engines of cars, boat, etc. They lobby government for broad and inclusive policies for alternative fuels. Finally, the oil lobby, mainly represented by the National Petrochemical and Refiners Association (NPRA) and the American Petroleum Institute (API), promote a balanced national energy policy, with no punitive taxes for gasoline and petrochemical producers and adequate research on ethanol-gasoline blends higher than 10% for non-flex fuel vehicles.

As the ethanol industry began to reach its maturity stage, a wide array of groups emerged to promote investment in infrastructure, technology development and use of advanced biofuels (e.g, Advanced Biofuel Association, American Biofuels Council, and National Biodiesel Board). These groups promote policies that support technology neutrality, use of sustainable inputs to produce biofuels and subsidy parity for second

generation biofuels to guarantee a leveled playing field. Actions taken by these groups that challenge ethanol and promote further innovation in the biofuels industry have contributed to the transition of the ethanol industry to its maturity stage and perhaps one step closer to its decline, as will be discussed below.

5.2.4. Industry maturity

In 2008, the corn ethanol lobby was divided, an event that triggered a battle within the corn ethanol lobby itself (Birger, 2009; Snyder, 2009; Sugarcane Blog, 2009). In a memo to Growth Energy and the RFA, the National Corn Growers Association's president Darrin Ihnen, stated that he had "given up on trying to work with both organizations, who are spending more resources criticizing each other than promoting the corn ethanol industry" (Sugarcane Blog, 2009). This separation occurred because some ethanol producers thought that the traditional corn ethanol lobby had not been fighting for ethanol hard enough, especially because the RFA is mainly backed by ADM. Growth Energy was created in 2008 to represent the corn ethanol industry, led by the CEO and founder of POET Energy. POET, unlike ADM, owns little stake in the plants it builds and operates. Also unlike ADM, ethanol is their only business. For ADM, as an ethanol producer but also large scale food processor, the variation in the price of corn is a smaller risk. ADM is also careful in taking extreme positions and actions, since it is a member of the Grocery Manufacturer Association (GMA), which is an anti-ethanol group altogether. Growth Energy, therefore, was created to more aggressively lobby in

favor of corn ethanol. It has attracted many small scale ethanol producers, since their interest seemed to be more aligned with POET's (Birger, 2009; Snyder, 2009). The split between the corn ethanol lobbies seems to be correlated with the industry structure shift. Growth Energy has attracted most producer-owned ethanol producers, while the RFA's membership continues to be largely composed by investor owned firms, particularly ADM[26]. This division has weakened the corn ethanol lobby and caused the corn lobby to decrease its support to the ethanol lobby.

To make matters worse, in 2008, corn prices stumbled down to $4 a bushel and the ethanol "bubble" popped. Many ethanol producers, like VeraSun, had purchased corn futures contracts, fearing that the price of corn was going to increase. The price of gasoline also decreased, reaching an all time low of $1.59 (in real dollars) in December, 2008[27]. This shock in the ethanol market resulted in huge losses and many companies in the industry went out of business. ADM was safeguarded by its diversity, but still wrote down "$60 million in ethanol inventory in early 2009" (Blitstein, 2009).

VeraSun, one of the largest ethanol producers in the country, filed for Chapter 11 bankruptcy in 2008. According to Zeller (2008): "The company, based in Sioux Falls, S.D., revealed in a Securities and Exchange Commission filing in September that it had entered into procurement contracts to buy corn at prices near the commodity's apex of roughly $8 a bushel in mid-summer. Since then, the price has tumbled to roughly half

[26] The RFA does not publicly disclose its members. However, Growth Energy's membership is largely composed of producer-owned companies. Member list available online at: http://www.growthenergy.org/about-growth-energy/structure-members/our-members/.
[27] U.S. Energy Administration Information. Available online at: http://www.eia.doe.gov/oog/info/gdu/gasdiesel.asp.

that". In 2009, Valero Energy Corporation, the largest independent oil refiner in the US, outbid ADM and bought seven VeraSun ethanol plants for $477 million. The price paid for the plants was, not surprisingly, below their book values and a fraction of what it would have cost to produce new plants (Krauss, 2009). In 2010, Valero added three more ethanol processing plants to its operations. The company is currently one of the biggest ethanol producers in the US, along with ADM and POET (RFA, 2010). Valero currently owns approximately 1.1 billion gallons of production capacity, ADM owns approximately 1.5 billion gallons and POET approximately 1.5 billion gallons (RFA, 2010). The fourth largest producer is Green Plains Renewable Energy, which owns approximately 660 million gallons per year of production. Together, these four companies own about 4.7 billion gallons (44%) of the total ethanol output in the country. The larger share (56%) of capacity is owned by a great number of small companies. According to the RFA, farmer-owned firms own approximately 32% of ethanol output capacity in the country. POET alone owns 14%. ADM owns another 14%, a staggering decrease from the early ethanol days when it owned over 60% of the total capacity (RFA, 2010).

The US government's support to ethanol producers has contributed to the creation and growth of the domestic ethanol industry (Bandow, 1997; Bovard, 1995). However, the industry has been increasingly challenged by a large number of researchers, environmentalists, and politicians that question the real benefits of ethanol and the necessity of maintaining the industry's generous subsidies. Also, increased

pressure from other groups that have a direct or indirect stake in the issue has also contributed to weaken the corn ethanol lobby, which now finds itself divided and isolated (Interview information). Major groups, such as the livestock and poultry lobbies have been fighting to decrease the government support received by the corn ethanol industry. Earlier this year, the two trade groups sent a letter to the House Committee on Ways and Means, "asking that they allow the 45 cents per gallon blenders' tax credit and the 54 cents per gallon import tariff for ethanol to expire at the end of this year" (Sugarcane Blog, 2010).

The increased competition in the ethanol industry, along with growing criticism from opposing groups have prompted the corn ethanol lobby to increase its lobbying efforts to influence legislation and regulation. In 2009, RFA and Growth Energy sued the California Air Resource Board (CARB), part of the California Environmental Protection Agency, over the Low Carbon Fuel Standard (Looker, 2009). The Low Carbon Fuel Standard (LCFS) was established in 2007 by the CARB and consists of a rule to reduce GHG emissions in transportation vehicles by using cleaner sources of energy, such as natural gas. The LCFS is a state-level standard and was the first to include indirect land use change impacts in GHG lifecycle emissions calculations[28]. RFA and Growth Energy claimed that the LCFS "unfairly discriminates against corn-based ethanol made primarily in the Midwest, in violation of the Commerce and Supremacy clauses of the U.S. Constitution" (Looke, 2009).

[28] California Air Resource Board. Available online at: http://www.arb.ca.gov/fuels/lcfs/lcfs.htm.

In 2010, Growth Energy started lobbying the government aggressively to increase the maximum inclusion rate in low-blend fuels to 15% from 10%. The EPA replied to a letter sent by Growth Energy stating that the agency would consider approving the higher blend. This event raised many concerns and reactions from other groups. Oil companies, vehicle manufacturers and recreational boat users, worried about the impacts of such measure, sent a letter to the EPA: "We urge EPA to base its decision on a complete and sound scientific record" (Costello, 2010). The EPA delayed the decision until further research had been done. However, with the oversupply of ethanol hurting the industry's profit, the ethanol lobby continued to pressure the EPA to approve higher blends (Brasher, 2010). In a letter to the EPA, ADM urged the agency to approve the increase in the ethanol gasoline blend rates, alleging that the ethanol market is saturated (Brasher, 2010). The RFA also sent a letter to EPA requesting the approval of the maximum inclusion rate in low-blend fuels[29]. Although many groups urged the EPA not to approve higher blends of gasoline and ethanol for non-flex fuel vehicles until further research had been conducted, the regulatory agency approved E15 for cars newer than 2007 (EPA, 2010b; Tracy, 2010). However, because E15 is not a requirement and because it is only approved for newer vehicles, it is very unlikely that blenders will offer the higher blends. The approval of E15, therefore, will have no significant market effects on the supply of ethanol[30].

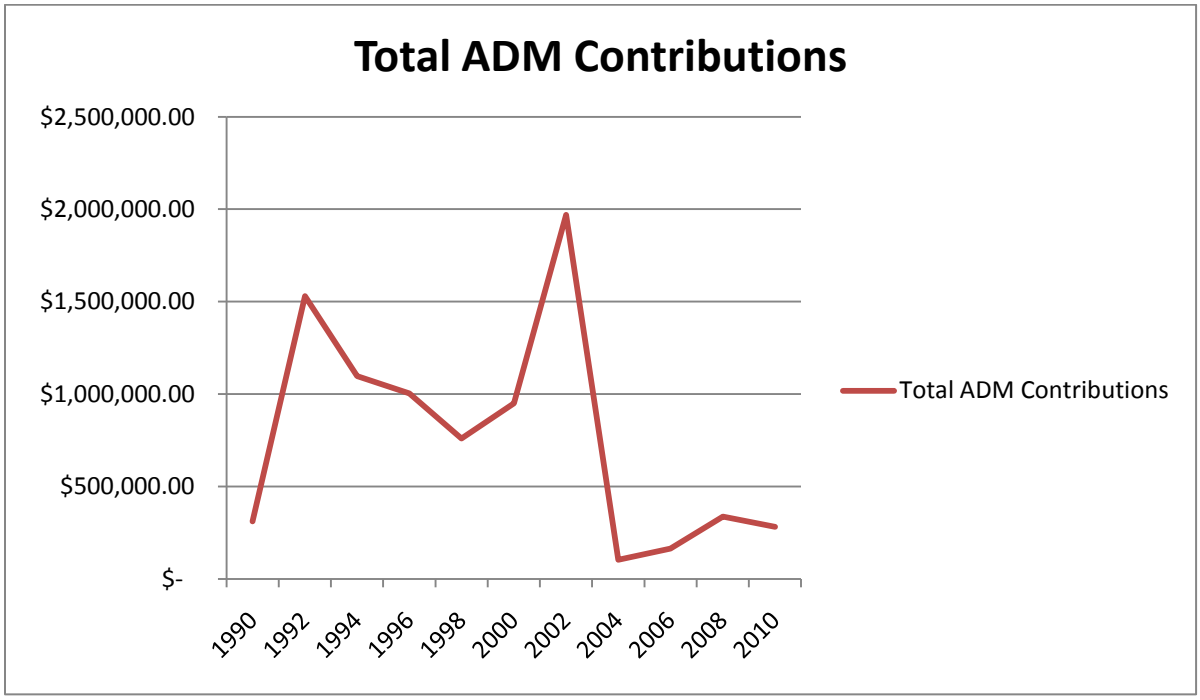
[29] The letter is available online at: http://www.ethanolrfa.org/page/-/RFA%20Letter%20to%20Jackson%20re%20E15%20and%20RVP%205-14-10.pdf?nocdn=1.
[30] RFA. Available online at: http://www.ethanolrfa.org/exchange/entry/e15-scenerios/.

The domestic ethanol industry grew at a fast pace in the past ten years. Although investment has slowed down since the 2008 “crisis”, ethanol output is still growing at a faster rate than the national demand. This oversupply has resulted in high inventories, increased exports and lower ethanol prices. The oversupply of ethanol is a result of the subsidies provided by federal and state governments to support the production and use of ethanol. The industry subsidies stretch the shut down point of the companies in the industry. Companies that would shut down production without the subsidies, stay in business, resulting in the oversupply of ethanol. Also, the federal blender’s tax credit motivates ethanol producers to produce beyond the mandated volume (Interview information). According to the RFA, ethanol production this year has already reached 13.9 billion gallons, which is approximately 1 billion gallons above the mandated volume (12.95 billion gallons in 2010). Domestic demand in the short run is constrained by the 10% blend wall (now 15% for vehicles 2007 or newer).

5.2.5. The decline of ADM?

It becomes clear from the section above that, although ADM is still a significant player in the ethanol industry, the company has lost the almost exclusive benefits it enjoyed in the early days of ethanol. After four decades, Allen Andreas was the last member of his family to be in control of the company (Lambert, 2006). Since 2002, the company’s political contributions have significantly decreased (Graph 3).

Graph 2: Total ADM political contributions from 1990 to 2010



Source: Center for Responsive Politics

The Center for Responsive Politics does not have information about ADM's political contributions prior to 1990. However, it is clear from previously cited sources that ADM was a major political contributor during the 1970's and 1980's as well. Interestingly, the years where ADM's political contributions are highest coincide with the time when the Andreas family was in control. The company still spends millions of dollars in lobbying every year. According to the US Senate's official lobbying disclosure report, ADM spent over $1 million dollars in lobbying in 2009 and over $2 million in 2008[31]. These values are high considering that one of the company's main competitors in the ethanol industry, POET, spent $0.7 million with lobbying in 2009 and 0.5 million in

[31] US Senate. Available online at: http://www.senate.gov/legislative/Public_Disclosure/LDA_reports.htm.

2008. Furthermore, according to an interview conducted with a member of Group J, the company continues to sponsor campaigns and politicians in TV shows directed at opinion formers and policy makers, such as “Face the Nation” and “Meet the Press”.

ADM’s current CEO, Patricia Woertz has been reluctant to talk about ADM’s ethanol business. Since 2008, ADM’s biofuel division has been hurting. With the ethanol industry’s future uncertain, the company has put its ethanol projects on hold (Blitstein, 2009). According to Blitstein (2009), “there’s no guarantee ADM will remain a dominant player in a future biofuels market”.

6. Theoretical analysis of the narrative

In the sections above, I described the major events and actors that have shaped biofuels regulation in the US. The evidence presented about the initial years of ethanol regulation in the US indicates that ADM played a significant role in the creation of the market. After the first oil crisis, in a moment of uncertainty and a strong price signal that indicated there might be profits in ethanol, ADM recognized the opportunity to promote institutional innovation through exerting its political influence on the government. Had Mr. Andreas not been such an influential figure in Congress for providing such generous campaign contributions to politicians and political parties or had the oil crisis not taken place, the ethanol market in the US might have never existed. The strong influence of the corn ethanol lobby in farm states and the efforts expended by ADM and the RFA to create and establish a market for ethanol after the first oil crisis in 1973 led the series of events that shaped the current biofuels market.

After the first ethanol policies were established by the US government, other groups recognized the opportunity to enter this "political market" and compete for the rents created by ADM. Brazilian ethanol and non-ethanol-based gasoline additives, such as MTBE were the first threats. ADM continued to exert a large amount of influence on ethanol regulation. The government promoted the expansion of the industry through

subsidies provided to new and existing ethanol producers. As the industry expanded, new players such as POET Energy and VeraSun started to compete with ADM. By 2002, the industry concentration ratio had declined significantly to 49% from 73% in 1987. Many new producers were entering the market, attracted by state and federal ethanol production subsidies. The industry experienced a shift from investor owned firms to producer owned firms. By 2007, with the establishment of the RFS and the RFS2, ADM owned 14% of the industry capacity, a staggering decrease from its 60% market share in the 1980's and 1990's.

In chapter 3, I argued that there is a significant difference in the role played by political entrepreneurs and common interest groups. Political entrepreneurs promote institutional innovation to create new rents, while common interest groups compete for existing rents. The political entrepreneur recognizes, in a moment of uncertainty and instability, the opportunity to promote long lasting institutional change by exerting political influence. They play a role in the process of drafting new legislation and, therefore, can make the rules of the game to their favor. The case study presented above provides evidence to support ADM's, or Mr. Dwayne Andreas' classification as a political entrepreneur. Ethanol legislation did not exist before Mr. Andreas' efforts to create it. His political connections and influence allowed him to take advantage of a moment of uncertainty and instability (after the first oil crisis in 1973) to create new rents through ethanol subsidies. Mr. Andreas was closely involved in the process of

drafting the gasohol federal tax break bill in 1978, which marked the beginning of a long history of ethanol subsidies.

Once the new rents had been created through ADM's entrepreneurial efforts, other interest groups realized the opportunity to compete for these rents by producing political influence. The Clean Fuels Development Coalition, for example, realized the opportunity to influence the government to extend the gasohol tax breaks to another ethanol based product: ETBE. Brazilian ethanol producers also sought to compete for a share of the rents created by ADM and Mr. Andreas. The subsidies initiated by ADM's efforts created a new market that otherwise might have never existed. However, once the initial uncertainties related to the innovation were reduced, other groups started to enter the market to compete for the rents created through this institutional innovation. New ethanol producers, such as POET and VeraSun did not do anything novel. They only entered a market that was expanding due to heavy government support. This discussion leads back to the first hypotheses set forth in this study:

Hypothesis 1: Pressure groups will compete for rents that have been created by political entrepreneurs, who recognized in a moment of uncertainty and instability the opportunity to transfer wealth from one group to another by promoting institutional change.

Due to the evidence provided above, I fail to reject hypothesis 1. ADM was likely the most significant player in creating and perpetuating the ethanol subsidies in the US. Had ADM not played the role of the institutional innovator, corn ethanol might have

never been such an attractive market and US biofuel policy would probably be different. For many years ADM managed to appropriate most of the rents created through their own entrepreneurial efforts. As the major ethanol producer in the country and with Mr. Andreas' political connections, the company was able to exert a large amount of influence on ethanol regulation. However, it is clear that, as the industry expanded, the scenario changed. Many other groups realized the opportunity of such artificially created market and transformed the ethanol industry into a highly competitive environment.

In chapter 3, I also argued that after creating new rents, the political entrepreneur becomes a competitive interest group. I hypothesized that, because of their role in drafting legislation in the innovation stage, they have a first mover advantage when competing with other groups for the rents that they created. In the early days of ethanol, when Dwayne Andreas and Senator Bob Dole were leading the ethanol cause, ADM enjoyed a large share of the government's support. Dwayne Andreas was politically well connected and a generous contributor to politicians and political parties. Senator Dole was Mr. Andreas's personal friend and main sponsor of the ethanol cause in Congress. The 1996 price fixing scandal involving ADM was an exogenous shock that definitely contributed to the decrease of ADM's political influence, although the company continued to express its policy preferences through the RFA. The retirement of Senator Dole and Mr. Andreas around the same time also contributed to the company's decline. However, above anything, the rents that ADM

essentially created were also the rents that promoted the expansion of the industry. The shift in industry structure and subsequently the division of the ethanol lobby weakened the RFA and the corn ethanol lobby in general. The boom in ethanol caused by the volume mandates imposed by the government has resulted in an oversupply of the product and an industry where any advantage has been competed away. Such conclusions lead back to the second hypothesis proposed in this study:

Hypothesis 2: Political entrepreneurs have a first mover advantage when they become a competitive interest group because of their role in drafting the legislation and because of their influence on the legislative branch.

I also fail to reject this hypothesis, although the proposition does not establish a time frame for the duration of the first mover advantage. The evidence provided suggests that ADM may have enjoyed a first mover advantage over other players in the industry during the first years of the subsidized ethanol market. However, if this advantage existed, it was competed away by a rapid expansion of the industry in the early 2000's. Although ADM continues to be highlighted as a significant player in the industry, the company has turned into "one more" of many companies competing for biofuel rents.

Throughout the history of ethanol subsidies and until the present, ADM, along with other ethanol producers and the diverse range of interest groups involved in the issue, have sought to influence ethanol legislation and regulation. In chapter 3, I argued that the levers of influence used in the different stages of the process (i.e., creating

rents and re-allocating rents) are different. In the rent creation stage, the marginal profitability of influencing the legislative branch is higher than any other branch, since creating rents, in this case, consists of creating innovative legislation. In the re-allocation stage, the marginal profitability of influencing the executive or the judiciary branches is greater than that of the legislative branch, since those allow groups to influence the fine print, or the implementation rules of legislation.

Because political entrepreneurs seek to create new rents through institutional innovation, they are more likely to expend greater efforts on influencing the legislative branch of government. However, once the market expands and the political entrepreneur becomes a common interest group, the marginal profitability of influencing the legislative branch may decrease significantly. ADM expended a large amount of effort on influencing the legislative branch, especially before the market started to experience fast growth and new entrants. ADM and Dwayne Andreas provided political contributions to congressmen from both political parties in exchange for favorable legislation. In 1978, the bill that granted federal tax breaks for gasohol was introduced by Senator Dole, who was Mr. Andreas' personal friend and a benefactor of his political contributions. ADM took advantage of their political connections and influence to obtain favorable legislation. In 1980, Senator Dole, influenced by Mr. Andreas, introduced the bill that would impose trade barriers on Brazilian ethanol. The marginal profitability of influencing the legislative branch was higher than any other for ADM, since the company was promoting innovation in the rules of the game.

While ADM took advantage of their political connections and influence to obtain favorable legislation, other groups sought to influence the implementation rules, or the fine print, of ethanol and biofuels laws. The Clean Fuels Development Coalition (CFDC), for example, took advantage of the initial gasohol tax break law imposed by the government to lobby the executive branch to extend those tax credits to ETBE. The extension was granted through an IRS ruling. Had the initial tax credit not been in place for gasohol, the CFDC would not have been able to pressure the IRS to rule the extension of the tax credits to ETBE.

The fast expansion of the ethanol industry lowered the profit opportunities that were initially available when the ethanol market was created. During the development stage of the industry, as ADM became a common interest group, their levers of influence changed. In 1981, the RFA was created to represent the corn ethanol lobby. Additionally, after the lysine price fixing scandal, ADM's political influence among Congressmen decreased. Furthermore, there was a strong call from scientists, environmentalists and politicians for renewable fuels beyond ethanol, which broadened the scope of energy policy in the country. The EPA became a central actor in this stage. The agency is responsible for the implementation of the Renewable Fuels Standard (RFS). At this point, with the ethanol legislation enacted, the interest groups involved in the issue sought to influence the implementation of policies through the EPA. Many groups, such as the Grocery Manufacturers Association, the Livestock lobby and environmentalists sent letters to the EPA regarding the potential harmful effects of

gasoline with ethanol. These groups expended a large amount of effort on influencing the executive branch, since the ethanol policies had already been passed by Congress. The RFA and Growth Energy lobbied the EPA to increase the ethanol-gasoline blends. The oil companies and auto manufacturers lobbied the EPA against this increase. The RFA and Growth Energy have also sought to influence regulation through the judiciary branch. In 2007 they filed a lawsuit against the California Air Resource Board, claiming that the Low Carbon Fuel Standard (LCFS) unfairly discriminated Midwest corn ethanol.

Currently, with the ethanol federal tax credit and the import tariff set to expire in December, ethanol opposing groups, like the livestock lobby have increased their efforts to influence Congress, who is responsible for passing new legislation that can renew such subsidies. In 2010, two livestock trade groups sent a letter to the House Committee on Ways and Means to request that they allow the tax credit and import tariff to expire. The RFA has also sought to increase their level of influence on Congress to renew these subsidies. At this point, the marginal profitability of influencing the legislative branch is greater than any other branch, since new legislation needs to be enacted in order for the subsidies to remain in place. The discussion above leads to the last hypothesis proposed in this study:

Hypothesis 3: The effective effort of each group in influencing different levels of government is dependent on the role they play in the creation of new rents or competition for existing rents, and will determine the marginal profitability of institutional change from influencing each level of government.

I also fail to reject this hypothesis. Although all groups seek to influence policies through all three levels of government, the direction of their efforts will largely depend on the issue at stake and on the stage of the policy making process. The marginal profitability of influencing the legislative branch is high when a new bill is introduced to Congress. This profitability decreases after the bill is passed. When laws are being implemented by the regulatory agencies, the marginal profitability of influencing the executive branch or the judiciary branch increases.

7. Conclusions and directions for future research

This study has sought to begin to bridge a gap in the biofuels regulation literature. I have used the theories of political economy and political entrepreneurship to identify the roles played by the actors in the market in shaping current biofuels regulation. ADM, in particular, was identified as the force behind the institutional innovation that gave rise to the initial ethanol subsidies after the first oil crisis in 1973. The company's entrepreneurial efforts initiated a new market for a product that would otherwise not have been feasible to produce. When the industry started to expand rapidly due to the government's support, ADM lost its initial advantage, as many other ethanol and biofuels producers entered the market. ADM became one more player in a highly competitive industry with an uncertain future. The company continues to express its political preferences, mainly through the RFA. It becomes clear that ADM's force in influencing legislation was mainly due to Dwayne Andreas' political influence among Congressmen and politicians.

The ethanol industry case study has proven to be interesting and informative in beginning to bridge the gap identified in the biofuels literature. Further research on the entrepreneurial roles of actors is called for in order to understand their characteristics and motivations to promote institutional changes through influencing the political

system. Also, a better understanding of the first mover advantage time frame will provide useful insight in understanding the roles these actors play.

I have proposed that the theories of political entrepreneurship and political economy are complements, as opposed to mutually exclusive or substitutes. Although the biofuels case has provided evidence to supports such hypothesis, it is only one case. Further research, including multiple case studies of different industries, should be conducted to further test such theoretical proposition.

Appendices

Appendix 1: Case Study database

1. Interviews:

Table 1: Information on levers of influence

	Topic: Levers of influence
Group C	- Letters, comments and contributions to state and national level regulatory agencies and legislators. - Support from indirect groups that can endorse the case and lobby in their favor. - Campaigns to taxpayers/voters/policy makers. - Regulation is constrained by legislation. - Influence on regulation is technical and influence on legislation is political.
Group I	- First resource: new or existing policy formal commentary process for stakeholders, meetings with decision makers (making your case and having government officials working on your behalf). - Constituency members, Congressmen of house and senate: authorizers (policy developers) or appropriators (funders). - Interest groups meet with members of the relevant committees to make their case and get government representatives to work on their behalf. - Last resources: White house political operations;
Group K	- Private sector coalitions. - Political contributions (money speaks louder than ideology). - First attempt: influence primary legislation: laws, such as the environmental policy act; - Once laws are in place, will seek to influence secondary or tertiary legislation. - Secondary legislation: regulations, through regulatory agencies, like the EPA: the fine print of the more general laws; - Tertiary legislation: standards (public and private);
Group J	- Contributions to Congressmen; - "Mapping of the way" through reports and research done by government funded institutions, such as the USDA. - Iowa Caucuses. - Emphasis on the importance of the media. - Influence of corn ethanol lobby comes from the story they tell:

	They emphasize the importance of the family farmer and of green energy produced domestically in the US and tell a nice story that makes them look good. - Subsidies are concentrated in certain areas.

Table 2: Information on institutions and institutional change

	Topic: Institutions and institutional change
Group C	- District vote/electoral system; - Structure of Congress;
Group I	- None.
Group K	- Structure of Congress: subcommittees that work in particular policy areas; - District vote (Congressional districts); - Corn ethanol lobbyists have high level of influence through this political system because of their representativeness in many corn producing states and districts in the US; - Bottom-up policy making through lobby; - Lobbying in the US is used to change contexts;
Group J	- The structure of US Congress, through district house representatives allows for beneficiaries to be closer to Congress representatives and, therefore, influence their agenda and policy. - Iowa caucuses: disproportionate amount of influence that the agriculture lobby exercises on the electoral calendar on presidential election years because of it.

Table 3: Information on the roles of actors

	Topic: Roles of actors
Group C	- ADM was the first to lobby government for ethanol subsidies seeking to establish a new market for corn. They had high fructose corn syrup processing plants, which could be used to process ethanol. - RFA was created and is mainly maintained by ADM. - Biofuel policies are agricultural policies disguised as environmental policies. It is maintained by the corn ethanol lobby, which is now fighting against opposing interest groups and politicians who realize the inefficiency and the social costs of this highly subsidized and protected market. - Corn ethanol lobby is now isolated.
Group I	- None.

Group K	- Policy innovators play an important role in the US because lobby is a legal activity that allows for interest groups to have a direct and transparent influence on policy making.
Group J	- ADM major sponsor of DC Sunday shows directed at opinion formers and policy makers, such as “Face the Nation” and “Meet the Press”. - ADM received at least half of all the corn ethanol subsidies in the 80’s and 90’s;

2. Studies:

Table 4

Study	**Archer Daniels Midland: A Case Study in Corporate Welfare**
Author	James Bovard, Policy Analysist - Cato Institute (Bovard, 1995)
Objective	Study the dynamics of corporate welfare (how the welfare state encourages rent seeking and how these practices corrupt the political life of a nation) by examining ADM, one of the major corporate welfare beneficiaries in the US.
Relevant Info	-ADM is one of the few welfare recipients that spend millions of dollars on advertising in Sunday morning television shows populated and watched by politicians. -ADM's corporate rent seeking is derived from three main sources: the ethanol program, the sugar program, and subsidized grain exports. -Dwayne Andreas is ADM's CEO from 1971 to 1997 and most important figure in ADM's history of obtaining corporate welfare. -ADM has a long history of political contributions to politicians; chairman believes it is his divine mission to give money to politicians for providing "public services". -July 1995, Wall Street Journal article: Dwayne Andreas reigned as prince of political influence. - Andreas will "bankroll" any politician, regardless of ideology or political creed, as long as they support ethanol or sugar policies. -At the time of the study, Andreas had provided generous contributions and political support to both senator majority leader Bob Dole and senate minority leader Tom Daschle. - In the senate, Bob Dole has been the chief sponsor of the ethanol subsidy. -Andreas, his family members and ADM have contributed over $4 million dollars to Congressional and presidential candidates and to the democratic and republican campaigns. -"Nothing symbolizes ADM's political exploitation of Americans better than ethanol" (p.6). -Ethanol is a "political concoction" – a product that is used and exists only because of the government's interference in the marketplace. -Ethanol is the "great white hope" of the farm lobby. They seek to obtain subsidies to transform crop surpluses into fuel and drive the prices of corn up "forever". -"When OPEC restricted oil production again in 1978--and the Carter administration tightened oil and gasoline rationing, creating artificial panic--Andreas arrived at the White House with a salvation scheme.

	Why not increase subsidies for ethanol? According to Frank Greven, who is working on a book on Andreas and ADM, "During the 1978 Persian Gulf oil crisis, he convinced Carter that using ADM's ethanol as a lead-free octane booster in gasoline would promote energy independence and cleaner air."(39) As part of its grandiose solution to the energy crisis--which the president pro- claimed to be the moral equivalent of war--the Carter administration drove through Congress a plan to exempt gasoline with 10 percent ethanol from the 4-cents-a-gallon federal fuel excise tax" (p.10). -In 1981, Andreas sent a letter to the department of energy to complain about imported Brazilian ethanol and to ask them not to provide loans to small, "inexperienced" ethanol producers. -In 1986, the price of corn increased and the price of gasoline fell. To keep ethanol "in the game", Andreas and his top lobbyist met with USDA secretary Richard Lyng to suggest USDA free gifts of corn. Two days after their meeting, Lyng announced a $29 million gift of corn to ADM and other multi-million dollar gifts to ethanol producers. Although other USDA officials suggested the gifts only be presented to producers in financial distress, secretary Lyng made sure the distribution be "fair". -In 1994, the Clinton administration announced that it would impose an ethanol mandate on gasoline. More corporate welfare for ADM as there were no conclusive studies about the real environmental impact of ethanol (p. 18 & 19). -The ethanol lobby funded the campaigns and advertisements against MTBE (with the support of Congressman Tom Harkin (D-Iowa). -Corn ethanol producers, not satisfied with the tax credits, lobbied government to impose an import tariff on Brazilian ethanol. -The Justice Department, the Office of the Special Trade Representative, and the Treasury Department objected the tariff arguing that it would raise costs to consumers, provoke retaliation from Brazil, and grant too much power to ADM. - In 1987, in the National Review, Michael Fumento reported that the import tariff imposed by the US government was initiated during a luncheon at the White House, where Andreas and a former ADM lobbyist told president Carter that ADM would launch a new grain-alcohol plant in Iowa if the administration would guarantee its profitability by imposing the tariff on Brazilian ethanol. -With the import tariff in place, the government created the Caribbean Basin Initiative (CBI), which granted Caribbean producers duty free entrance in the US. Caribbean produced ethanol qualified for duty free entry because more than 35% of the value of the finished product was added by Caribbean producers.

	-“US producers, led by ADM, working through the RFA, engineered an early-morning rule change to strangle any possible foreign competition in the crib” (p. 23). -“**ADM’s lobbying and campaign contributions have certainly been the key force in creating and perpetuating federal ethanol subsidies**” (p. 35). - ADM’s political strategy has long been based on the ideas that politicians should control prices and markets and that ADM and Andreas should control politicians.
Conclusion	-“ADM's finagling in Washington may have cost taxpayers and consumers more than $40 billion since 1980, counting the cost of the sugar program ($3 billion in higher prices each year), the ethanol program, and federal food giveaways and export subsidies. Some of those dubious programs probably would have been enacted even if Andreas had not been foisting cash on every politician in sight, **but ADM deserves credit for being a decisive force in enacting and perpetuating many of the federal government's most abusive policies**” (p.35).

Table 5

Study	**ADM, Cargill – The Enron and Halliburton of the Ethanol Swindle**
Author	Marcia Merry Baker (Baker, 2006)
Objective	Understand the origin and history of ADM and Cargill in order to break the “ethanol romance”.
Relevant Info	-When the corn ethanol “market” was first created in the 1970’s, ADM and Cargill owned 70% of total capacity and have “dominated every policy turn since”. -Cargill and ADM now own only 24% of the market. -“Today’s manic bio-fuels bubble is not the culmination of a natural evolution toward “alternative energy,” but of schemes put into effect deliberately, by networks of financial circles, acting against national interests, for their own control and gain.” (p.13). -Rapid growth of the biofuels bublle in the past 10 years. “There has been a rush of investors, as well as farmer-owned cooperatives, lured into an ‘easy money’ corn ethanol market” (p. 14). -ADM started production of ethanol in 1976 and lobbied the government for federal subsidies because Dwayne Andreas needed a way to get rid of huge corn surpluses.

Table 6

Study	**The crutch of corn based ethanol**
Author	Zachary Guertin (Guertin, 2007)
Objective	Show that corn ethanol is unsustainable and not proper to meet energy and national security concerns of the US. To prove this point, the author seeks to identify the supporters of the product in the US and to uncover their motivations and how they compare to that of the US government.
Relevant Info	-In 1973, when the negative impacts of lead in gasoline were being felt, increased demand for octane boosters. -Beyond the push for ethanol as a blending agent, after the first oil crisis there was an increased need to find renewable fuels. -Energy Tax Act of 1978: tax exemption for gasoline containing 10% ethanol. -Ethanol production jumped from 50 million gallons in 1979 to 175 million gallons in 1980. -Congress continued to enact a series of legislations to support ethanol production: loans, guarantees, tax benefits. -Congress passed a tariff on imported ethanol to protect the domestic market. -Even with 60cents per gallon subsidy in the 80's, ethanol plants were still shutting down because of the comparison of the price of ethanol to gasoline. -MTBE was more used as oxygenate, because it was cheaper. -The 1990's presented tough market conditions for ethanol due to corn shortages and low usage. -1999 some states begin to ban MTBE because it was found to be a carcinogen. -EPA recommended the elimination of MTBE in gasoline and called for the use of ethanol instead. -In 2005, through the RFS, ethanol demand really boomed. -"Ethanol's market has been sparked by U.S. government policies and global events more so than by domestic demand for biofuel technology"(p.23). -"Without constant government protectionism, the industry would have failed decades ago due to its inefficiencies and cost compared to alternatives" (p.23). -The interests of agribusiness companies have shaped the US biofuels industry. -Although there are many ethanol producing companies in the US, none can compete with ADM. -"Political connections, especially with legislators who have had significant influence over specific subsidies, have contributed to ADM's

	growth" (p.26). -Dwayne Andreas is one of the most prominent political campaign donors in the US and also ADM's CEO for 30 years. -Former vice-president Hubert Humphrey was Andreas's son's godfather and advanced many measures when he was Minnesota senator. -Senator Bob Dole (R-Kansas) advocated for the company throughout his political career. -"Senator Dole was ethanol's steadfast sponsor" (p.26). -Between 1985 and 1995, ADM received $424.5 million in federal subsidies from corporate welfare programs, like the Export Enhancement Program. All were approved and sponsored by the Senate Agriculture Committee (Bob Dole was a senior member of the Ag committee). -Almost half of ADM's profits come from products that the government has subsidized or protected. -Donations to senator Dole included: $200,000 to two campaigns, $275,000 to the Dole Foundation, and $500,000 to the Red Cross when Elizabeth Dole took heed of the organization. -ADM donated almost $8 million to politicians (republicans and democrats) between 1990 and 2007. -"ADM relies on the U.S. government to stabilize its inputs' markets" (p.28). -"The U.S. government keeps Ethanol's prices artificially high with a variety of trade, monetary and fiscal policies, laws and regulations. This includes taxes, tariffs, duties, subsidies and import and export restrictions on commodity products. A significant impact could be made on ADM's production of biofuel in changing any of those conditions due because ethanol would no longer be sustainable without those high subsidies and protectionist tariff" (p. 28). -Two main representatives of the ethanol industry: National Corn Growers Association and Renewable Fuels Association.
Conclusion	-"The U.S. government is spending countless dollars on a fuel that could not even be in existence without its support" (p. 43).

Table 7

Study	**Ethanol USA**
Author	Dennis Keeney (Keeney, 2009)
Objective	-The author reviews the environmental, social, economic, and food impacts caused by the rapid expansion of the ethanol market in the US.
Relevant Info	- ADM was the major producer of high fructose corn syrup by 1974 and

	sought additional markets for the products of ADM's wet mills (especially ethanol). -"In an intensive lobbying and educational effort, the president of ADM, Dwayne Andreas, began to aggressively promote ethanol as an automobile fuel. Andreas convinced politicians such as Senator Bob Dole (R-Kansas) and President Jimmy Carter that ethanol offered a way out of the 1973 OPEC oil embargo that had sent the American economy reeling" (p.9). -Ethanol friendly bills were passed both in 1978 and 1980, strongly supported by ADM, the farm and corn lobbies. -Several policies contributed to the development of the ethanol market, especially the blender's tax credit and the volume mandates. - "The stated purpose of the RFS is to increase American jobs, but the real reason is obvious: to increase the amount of corn-based ethanol" (p.9). -"The ethanol sweep was promoted by policy abetted by lobbying from 'Corn Belt' state interests. These included grain handlers and processor, especially ADM, and the establishment of a lobbying and educational organization, the Renewable Fuels Association" (p.9). -"There is little doubt that the first presidential caucus, always in Iowa, has played an important role. Any politician, be it dogcatcher or presidential candidate, speaking against ethanol in Corn Belt states has been doomed to denigrating letters, jeers from peers, and political obscurity" (p.9).
Conclusion	-"Had ethanol expansion been subject to environmental assessment guidelines and or life cycle analyses, the ethanol support policies, in my opinion, would never have been adopted. However, as I have stated, money, not science, has driven ethanol fuel policy" (p.9). -"The U.S. and many other countries got on and 'irrational exuberance' trip with biofuels in 2000-2005" (p. 10). -"Now government and the industries vested in corn-based ethanol will have to deal with the public opinion backlash, loss of political support, and financial insecurity. Corn and ethanol are commodities, and prices have fluctuated wildly in recent months. Currently the industry is operating on a small profit. This makes it even more dependent on subsidies" (p.10). -"ADM's Andreas got the biofuels ball rolling, unfortunately in the wrong direction" (p. 11).

3. Media Clippings

Table 8: Media clippings

Title	**The High-Octane Ethanol Lobby**
Source	Wall Street Journal
Author	Michael J. Weiss
Date	April 1, 1990
Information	-Tom Daschle, central man in the campaign to win tax breaks for ETBE. -ETBE has "political charm" because it is made with 40% ethanol. -75 senators, the EPA administrator and four Cabinet secretaries endorsed the extension of the ethanol tax credit to ETBE. -Extension of tax credits to ETBE was achieved thru IRS ruling. -Dwayne Andreas was a friend and confidant of former Vice President Hubert Humphrey, through whom he established many political connections. -Gasohol producers received more than $4.6 billion in Federal and state tax exemptions between 1980 and 1990. -ADM was a major benefactor, since they were responsible for 75% of US ethanol production at the time. -Critics have charged the tax breaks as corporate welfare for ADM. -ADM supported corn growers in winning subsidies for ethanol: the milling technology they had in place to produce high fructose corn syrup could also be used for ethanol. -Dwayne Andreas: believes in supporting mayor, Congressmen, and politicians; cultivated political connections with Democrats and Republicans. -"In the 1970's, Andreas met a young Kansas Republican Representative name Robert Dole, who would become ADM's staunchest ally on Capitol Hill – and today is the Senate Minority leader" (p. 2). - "Meanwhile, A.D.M.'s Political Action Committee, along with Andreas and his relatives, were contributing more than $130,000 to Dole campaigns". - Bob Dole sponsored Federal Tax break for gasohol and another dozen bills to promote and protect ethanol. -In 1980, Dole introduced and passed through the Senate a trade bill amendment to impose a tariff on Brazilian ethanol. -In 1985, Dole led the fight to reverse the Customs service ruling to allow blends of Brazilian ethanol (through the Caribbean Basin Initiative) to come into the US duty free. -ADM's political action committee, along with Andreas and his relatives: political contributions of more than $130,000 to Dole campaigns. -Andreas says that his relationship with senator Bob Dole is strictly

	personal. -During 1987-88 elections, Andreas gave at least $31,000 to individual candidates and more than $100,000 to the National Republican Party. -ADM's political action committee spent $160,550 on candidates ranging from Utah Republican Senator Orrin Hatch to Washington Democrat Thomas S. Foley, the speaker of the House. -Andreas was a frequent guest for dinner at the White House during the Reagan Administration. -ADM spends $7 - $8 million for advertising on shows such as "Face the Nation", "Meet the Press" and "This Week with David Brinkley" that are mainly watched by Washington lawmakers. -When the price of corn increased, and the demand for ethanol decreased (and gasoline prices went up), Andreas and one of ADM's lobbyist at the time met with Robert Lyng (secretary of ag) to discuss the discount corn program. -ADM received $29 million worth of corn, more than half of the entire $54 million Federal program. -Farm groups that have worked on ethanol's behalf: National Corn Growers Association, American Farm Bureau and the American Agriculture Movement. -In 1986 the USDA issued a report stating that the ethanol subsidies were counterproductive and that giving corn farmers direct cash payments would be more beneficial than trying to boost corn demand with ethanol programs. -Senator Bob Dole led a Congressional campaign to urge the USDA to work on behalf of ethanol. The USDA ethanol task force issued another report, about eighteen months later, concluding that it was cheaper to subsidize ethanol than corn. - ADM and RFA are closely intertwined and ADM was the largest contributor of RFA at the time. -Douglas Durante, of the Clean Fuels Development Coalition (CFDC) affirmed that there is no industry in the world so dominated by one company. -The CFDC was created to promote and expand the ethanol industry outside of ADM's territory. -With the government seeking to phase out lead in gasoline, ETBE and MTBE became evident as octane enhancers for gasoline. -MTBE was cheaper to produce and was a well developed product. MTBE was phased out because it was considered toxic. -ADM did not support ETBE, mainly because a lot less ethanol goes into making ETBE than gasohol. -Senator Dole was asked to support ETBE and declined at first.

	-Petition for extension of tax break was filed in the Treasury Department by Arco Chemical Company. -Senator Tom Daschle was the main leader of the cause in Congress. -ADM backed Renewable Fuels Association was against expansion of the industry through new plants, imports or methanol. -IRS ruling approved the extension of the tax break to ETBE, before Congress could act. -The CFDC wanted a broader ethanol industry and the groups were constantly in conflict. -Andreas insisted that he did not worry about ADM having to shut down its ethanol plants because the ethanol division represents less than 10% of ADM's business.

Table 9: Media clippings

Title	**Ethanol keeps ADM drunk on tax dollars**
Source	Cato Institute online – daily commentary
Author	Doug Bandow
Date	October 2, 1997
Information	-Ethanol subsidies benefit ADM and not the public. -Ethanol subsidies indirectly subsidize ADM's production of ethanol for gin. -The ethanol program exists only because it has powerful friends. -Dwayne Andreas managed to obtain billions of dollars worth of subsidies for ADM to produce ethanol through generous contributions to both the Democratic and Republican parties. -Bob Dole's departure from the senate removed ADM's leading political patron. -Andreas also retired. His son and heir, Michael Andreas, was indicted in a federal price-fixing investigation, which led to his resign. ADM had to pay a fine of $100 million to the government.

Table 10: Media clippings

Title	**Boom in Ethanol Reshapes Economy of Heartland**
Source	New York Times
Author	Alexei Barrionuevo
Date	June 25, 2006
Information	-Boom in ethanol industry driven by: generous government subsidies, surging demand for ethanol as gasoline supplement, farm state politics and the potential to make a lot of profit in a short amount of time. -At them time at least 39 new ethanol plants were being built, projects that pushed the US above Brazil as largest ethanol producer.

	-Warren R. Staley: CEO of Cargill said there are unintended consequences of expanding ethanol production at this pace. -In the farm belt, politicians have promoted the ethanol movement as a way to explore a new market for corn, the most plentiful and most subsidized crop in the country. -" With Iowa home to the nation's first presidential caucuses every four years, just about every candidate who visits the state pays obeisance to ethanol". -The ethanol expansion started in the 1970's and 1980's when Dwayne Andreas contributed generous amounts of money to politicians in the Democratic and Republican parties. - "Adding to its woes, ADM was marred by scandal in 1996 when several company executives, including one of the sons of Mr. Andreas, were convicted of conspiracy to fix lysine markets. The company was fined $100 million. Since then, ADM's direct political clout in Washington may have waned a bit but it still pursues its policy preferences through a series of trade organizations, notably the Renewable Fuels Association". -ADM holds a policy that it does not lobby Congress directly. -ADM is the biggest beneficiary of ethanol subsidies in the US. -G. Allen Andreas, ADM chairman and Dwayne Andreas nephew.

Table 11

Title	**End of the line**
Source	Forbes online
Author	Emily Lambert
Date	April 10, 2006
Information	-"G. Allen Andreas has the tough job of handing ADM, his family's legacy, to an outsider". - For four decades ADM has been a publicly traded company, but has been dominated by one family: the Andreas family. -Allen Andreas took charge when Michael Andreas (Dwayne Andreas's son) was forced to resign due to the lysine price-fixing scandal involving the company in 1996. -Allen Andreas has not been as influential as Dwayne. -He retired in 1996, at age 62, after being in charge of ADM since he was 30.

Table 12

Title	**VeraSun Files for Bankruptcy Protection**
Source	Wall Street Journal online
Author	Tom Zeller Jr. (Zeller, 2008)

Date	November 1, 2008
Information	-VeraSun accounted for around 7% of ethanol production in the US in 2008. -The company filed for Chapter 11 Bankruptcy on October 31, 2008. -Among the factors that led the company to file for Chapter 11 were the global credit crunch and bad bets on corn prices. -"The company, based in Sioux Falls, S.D., revealed in a Securities and Exchange Commission filing in September that it had entered into procurement contracts to buy corn at prices near the commodity's apex of roughly $8 a bushel in mid-summer. Since then, the price has tumbled to roughly half that".

Table 13

Title	**Valero Energy, the Oil Refiner, Wins an Auction for 7 Ethanol Plants**
Source	Wall Street Journal online
Author	Clifford Krauss (Krauss, 2009)
Date	March 18, 2009
Information	-"Valero Energy, the country's largest independent refiner, said on Wednesday that it would buy seven ethanol plants from VeraSun Energy for $477 million, giving the biofuel industry a lift at a time when it is suffering from excess production capacity and falling gasoline consumption". -"The Valero purchase of an ethanol plant is the first by a traditional refiner, pumping cash into the industry at a time of tight credit and removing a potent political opponent, at least in part". -Valero outbid ADM in the competition for purchasing VeraSun's plants. -"The price Valero paid for the plants — in South Dakota, Iowa, Minnesota, Nebraska and Indiana — is a fraction of what it would cost to build new ones". -It is a good deal for Valero because they are required to blend ethanol into gasoline according to the government mandates. -"VeraSun, like many ethanol companies, has suffered financially in recent months after committing to buy corn last year at high prices. Those prices have since dropped sharply. In the meantime, ethanol prices have declined along with gasoline since last summer".

Table 14

Title	**Wesley Clark: Ethanol's Field General**
Source	Fortune Magazine online/CNN money website
Author	Jon Birger
Date	July 2, 2009

Information	-Food companies blame ethanol for rising food prices. -Environmentalists criticize corn based ethanol. -Wesley Clark: co-chairman of recently formed corn ethanol coalition Growth Energy. -Clark has lobbied against the Low Carbon Fuel Standard in California for holding ethanol accountable for land use change in Brazil. -Clark has lobbied to increase the ethanol-gasoline blend wall from 10 to 15%. -Clark has also campaigned against the claim that corn ethanol production is accountable for increases in food prices. -There are two wars being fought: one against ethanol critics and the other within the ethanol industry (referring to the fight between the Renewable Fuels Association and Growth Energy). -RFA has been recognized as a lobbying arm of ADM. -Owners and operators of ethanol plants built since 2005 pushing back on RFA. -Small ethanol producers and investors questioning whether their interests are aligned with ADM's. -ADM would not mind seeing smaller ethanol producers go out of business. -ADM will benefit no matter what happens to the price of corn, because they have a lower cost structure for producing ethanol due to economies of scale and they are also a large food processor. -Jeff Broin, CEO and founder of POET Energy is the force behind Growth Energy. POET surpassed ADM in ethanol production in 2007 and is now the largest producer in the US. -Ethanol is POET's only business and it owns like stake in the plants it builds and operates, unlike ADM, which is fundamental factor explaining the division of the corn ethanol lobby. POET's interests are more aligned with those of small ethanol producers. -Growth Energy claims that RFA not promoting ethanol aggressively enough. -In 2008, the Grocery Manufacturers Association (GMA) ran an anti-ethanol campaign. According to Jeff Broin, the RFA's response was slow, probably because ADM is also a member of the GMA. -The CEO of Growth Energy is Tom Buis, a former president of the National Farmers Union and top agriculture staffer for former US Senate Majority leader Tom Daschle. -Growth Energy has urged the EPA to approve E15 and RFA has also signed the petition. -RFA urged the EPA to consider E12 blend wall, thinking that E15 would be a dramatic increase that would take longer to be approved.

	-Many groups like auto and marine manufacturers, environmentalists and grocery manufacturers oppose this increase, claiming that there is not enough evidence that it won't have negative effects.

Table 15

Title	**'Family Feud' threatens to hurt ethanol lobby**
Source	The Hill online
Author	Jim Snyder
Date	October 10, 2009
Information	-NCGA president declared that "family feud" between the two corn ethanol lobby groups is a threat to corn industry. Warned the rival groups about serious consequences, such as loss of support on capitol hill. -NCGA president declared that it is important that all parties in the ethanol industry work together and warned RFA and Growth Energy that if they did not come to the table, the NCGA would end their association with them. -In response the RFA said that "our continued success has been threatened by divisions within the ethanol industry that have made it difficult to develop policy consensus and provide our allies with a clear sense of priorities." -Reasons why Growth energy was created: ethanol industry and corn industry were not effective at responding to attacks on ethanol for raising food prices. -Ethanol lobby in crisis, too many resources being directed towards criticizing one another. - Ihnen (NCGA president) listed the concerns: "- Champions for ethanol are reluctant to be meaningfully engaged - Political support for ethanol has waned - Supporters and allies for ethanol have significantly diminished". -Growth Energy has been the main force in the fight to increase the ethanol gasoline blend wall from 10 to 15%.

Table 16

Title	**Corn Growers, Ethanol Groups still wrestling over goals**
Source	Sugarcane Blog
Date	October 14, 2009
Information	-NCGA decided to continue working closely with the RFA and the American Coalition for Ethanol (ACE), but did not mention Growth Energy. -Growth Energy lobbyist Tom Buis said he had not taken the subject to

	his board yet and that is why Growth Energy did not have a position on the memo written by NCGA about the battle of the corn ethanol lobby. -The conflicts are generated both from differences in approach to deal with policy issues, and from the policy issues that are considered important. -Corn Growers, RFA and ACE are concerned with the expiring tax credit. -Growth Energy is more concerned with the land use change analysis used by the RFS and the California Low Carbon Fuel Standard.

Table 17

Title	**Ethanol and Corn Groups sue California over Fuel Standards**
Source	Successful Farming Magazine
Author	Dan Looker
Date	December 9, 2009
Information	-Growth Energy and the RFA filed a lawsuit against the Low Carbon Fuel Standard, established by the California Air Resources Board (part of the California EPA). -The two groups alleged that the new rule making proposed by the LCFS unfairly discriminates against corn ethanol farmers, especially Midwest based. - "The complaint, filed in federal district court in Fresno, California on December 24, says the fuel standard "is unconstitutional because (i) it conflicts with and is preempted by federal law, including the Energy Independence and Security Act of 2007; (ii) it interferes with the regulation of interstate commerce; and (iii) it discriminates against out-of-state corn ethanol producers and importers and improperly regulates their extraterritorial conduct."” - The lawsuit was also brought by farm groups: Rocky Mountain Farmers union, the Redwood County, Minnesota Corn and Soybean Growers, and Penny Newman Grain, Inc

Table 18

Title	**“ADM does the ethanol shuffle”**
Source	The Big Money
Author	Ryan Blitstein
Date	June 2, 2009
Information	-Patricia Woertz became ADM’s CEO in 2006, when ethanol was booming. -After the biofuled “bubble” burst ADM took a profit hit. -“Ethanol, or corn-derived fuel alcohol, was just beginning to remake the heartland economy. It seemed a political triple-whammy: creating a

	path toward independence from Middle East oil, lowering greenhouse gas emissions, and aiding American farmers. The government had announced a mandate for ethanol consumption and outlawed the fuel additive MTBE in gasoline, with ethanol the only alternative. Demand for the fuel surged—farmers switched their cropland to corn and formed co-ops to process the fuel. Venture capitalists rushed to fund new plants. The industry collectively broke ground on hundreds of new ethanol factories [7] in a matter of months" (p.1). -"ADM had a long history in biofuels, having basically invented the ethanol market during the late-1970s energy crisis" (p.1). - "The corn markets began swinging wildly [16], driving the per-bushel price from $2 to $4 to a record $6 and eventually up to $8. The unparalleled changes had a variety of causes [17]: market speculation, a weak dollar, a rising developing-world middle class that craved meat (which requires grain feed), higher energy costs, and demand for corn for ethanol". -"Many ethanol producers scrambled to lock in massive supplies during 2008, purchasing $10-per-bushel futures contracts. They needed to be able to count on a delivery price, fearing that costs might reach $12 by autumn. But around August, the corn bubble popped [18], and the price dwindled to $4. The ethanol business model crumbled for many companies: VeraSun Energy, the second-largest producer, declared bankruptcy [19]. BioFuel Energy, which had IPO'd at $43 per share in 2006, traded below 50 cents". -For now, ADM's bio-energy strategy is on hold. No project have been canceled, but bio-energy is not focus anymore.

Table 19

Title	**"ADM says ethanol market saturated, appeals to EPA"**
Source	DesMoines Register online
Author	Philip Brasher
Date	June 7, 2010
Information	-ADM petitioned the EPA to increase the ethanol blend limits to all vehicle models. -The EPA has been considering increasing the blend wall from E10 to E15, but only for newer vehicles (2007 or newer). -ADM asked the EPA to approve E12 for all models. -The company sent a 5 page letter to the EPA arguing that the ethanol market is saturated and that without higher ethanol blends allowed, it will be impossible to meet volume mandates in the next years. -"The agency is expected to issue a decision this summer on a petition by the industry trade group Growth Energy to allow the use of E15 in all

	vehicles". -"Growth Energy issued a statement from CEO Tom Buis saying that the group was sticking with its position that that the ethanol limit should be raised to 15 percent for all vehicles. ADM is a member of a rival industry group, the Renewable Fuels Association. RFA spokesman Matt Hartwig said, "We believe EPA can approve the use of E12 for all vehicles immediately while simultaneously finishing its evaluation and approval of E15 in the very near future."

Table 20

Title	**"Higher ethanol levels allowed in gas"**
Source	Wall Street Journal online
Author	Tennille Tracy
Date	October 14, 2010
Information	-"WASHINGTON—The U.S. Environmental Protection Agency on Wednesday approved an increase of ethanol levels in gasoline for model-year 2007 cars and newer". -"The decision has been criticized by auto makers, off-road equipment makers and the petroleum industry, which has urged the EPA to postpone a decision until more testing could be done". -These groups, along with environmentalists argue that not enough research has been done to guarantee that the higher blends will not have undesired consequences. -For cars 2001 through 2006 the EPA is still waiting more research to allow higher blends. -"The cause of boosting ethanol use in cars has been strongly championed by Growth Energy, an ethanol trade group led by Wesley Clark, the retired U.S. Army general and 2004 Democratic presidential candidate". -"Gen. Clark's group petitioned the EPA last year to allow ethanol levels in gasoline blends to be as high as 15%. Without the increase, the group said, the U.S. wouldn't be able to meet a Congressional mandate requiring some 36 billion gallons of renewable fuel to be blended into the domestic fuel supply by 2022".

Table 21

Title	**Meat Groups oppose Ethanol Tax Credit and Import tariff**
Source	Sugarcane Blog 2010
Author	-
Date	April 29, 2010
Information	-The American Meat Institute, the National Turkey Federation, the

	National Chicken Council and the National Cattlemen's Beef Association sent a letter to the House Committee on Ways and Means asking that they allow the tax credit and import tariff to expire at the end of the year. -"The corn ethanol industry responded saying that the livestock industry just wants cheap feed". -RFA was the corn ethanol group that responded to these groups.

Table 22

Title	**Oil Companies Push Back on Ethanol**
Source	NPR online – Planet Money
Author	Daniel Costello (Costello, 2010)
Date	January 8, 2010
Information	-" Refiners and oil companies joined vehicle manufacturers and recreational boat users in requesting the federal government does more research before allowing higher concentrations of ethanol in gasoline". -The request letter was sent to the EPA, which is considering raising amount of ethanol allowed to be blended into gasoline. - The letter was sent by The American Petroleum Institute, the Petroleum Marketers Association of America, the Society of Independent Gasoline Markets of America, the Alliance of Automobile Manufacturers, among other groups. -""We urge EPA to base its decision on a complete and sound scientific record," the groups wrote. They urged the Energy Department to exhaust a $15 million fund for research on ethanol blends before the EPA makes its decision".

5. Publications by interest groups

Table 23

Date	Title	Type
May 24, 2010	"Using more Brazilian ethanol would raise gasoline prices for DC drivers – with or without the tariff"	Research Publication
May 24, 2010	"What Brazil doesn't want you to know"	Research Publication
April 15, 2010	"Fuzzy Math" and Brazilian Ethanol: the numbers don't add up"	Research Publication
August 4, 2010	Letter to EPA regarding RFS2 ILUC emissions	Letter to EPA

*All publications and posts available online at: http://www.ethanolrfa.org.

Table 24

Date	Title	Type
May 21, 2010	"RFA living in a field of dreams when it comes to ethanol exports"	Blog post
June 28, 2010	"RFA: Cherry Picking Crop Data on Capitol Hill"	Blog post
October 14, 2010	"Brazilian sugarcane group call on Congress to end ethanol tax credits"	News

*All publications and posts available online at: http://sweeteralternative.com.

Table 25

Date	Title	Type
GMA, 2009	"GMA transition paper on biofuels for president Obama"	Research/letter to provide information to the government

*Available online at: http://www.bipac.net/page.asp?content=Energy&g=GMA.

Table 26

Date	Title	Type
Feb. 9, 2009	"America needs a true Renewable Energy Policy"	Research
May 18, 2009	"Ethanol – Gasoline fuel blends may cause human health risks and engine issues"	Research
June 14, 2010	"Huge taxpayer investment in ethanol yield paltry payoff"	Research

*Available online at: http://www.ewg.org/content/research/174.

Appendix 2: Map of Interest Groups

Table 1: Primary Interest Groups

	Corn ethanol lobby			Corn lobby
Interest Groups	**RFA**	**Growth Energy**	**American Coalition for Ethanol**	**Corn Farmers Coalition**
Participants	Ethanol producers (mainly ADM)	Ethanol producers (mainly POET)	Corn producers, ethanol producers, rural electric cooperatives	NCGA + 14 state corn associations
Preferred policy option	Higher ethanol blend walls, government subsidies for corn-based ethanol; trade barriers on imported ethanol.	Higher ethanol blend walls, government subsidies for corn-based ethanol, trade barriers on imported ethanol.	Higher ethanol blend walls, government subsidies for corn-based ethanol, trade barriers on imported ethanol.	Subsidies for corn-based ethanol and tariff on imported ethanol.
Lobby efforts	Renewal of tax credit and import tariff, higher ethanol blends, against indirect land use change models.	More aggressively promote corn ethanol, higher ethanol blends, against indirect land use change models.	Higher ethanol blends, against indirect land use change models.	Renewal of tax credit and import tariff, against food vs. fuel debate on production of corn ethanol.

Table 2: Primary Interest Groups Cont.

	Sugarcane ethanol lobby	Corn Users	
Interest Groups	**UNICA**	**GMA**	**Meat and Livestock Groups**
Participants	Brazilian sugarcane ethanol producers	Grocery Manufacturers Association (food producers)	American Meat Institute, National Chicken's Council, etc.
Preferred policy option	No subsidies, no import tariff.	No subsidies for corn ethanol.	No subsidies for corn ethanol.
Lobby efforts	Against renewal of subsidies and tariff.	Against government subsidies to support production of corn ethanol.	Against government subsidies to support production of corn based ethanol.

Table 3: Secondary Interest Groups

	Advanced biofuels lobby		Environmentalists	
Interest Groups	**ABFA**	**National biodiesel board**	**NGO's**	
Participants	2nd generation renwable fuels Amyris, BP, LS9, UNICA, Solazyme Inc.	Founded by state soybean commodity groups; feedstock and feedstock processor organizations, biodiesel suppliers, fuel marketers and distributors and technology providers;	Environmental Working Group (EWG)	Natural Resources Defense Council (NRDC)
Preferred policy option	Tax credit and incentive parity for second generation biofuels.	Government subsidies for biodiesel production.	Policies that promote conservation and sustainable development and not policies (subsidies) that damage the environment and natural resources.	No to national policies that subsidize environmentally un-friendly products.
Lobby efforts	Level playing field for 2nd generation renewable fuels: technology and sustainability neutrality and tax credit and incentive parity.	Maintenance of biodiesel tax credit; not annual renewal tax credit.	Against E15, provide information to policy makers and consumers about corn ethanol campaigns, alert to consequences of tax credits.	Passage of comprehensive clean energy and climate protection legislation.

Table 4: Secondary Interest Groups Cont.

	Oil lobby	Auto/Marine Industry Lobby	
Interest Groups	**Gasoline Producers**	**Car manufacturers**	**Boat manufacturers**
Participants	National Petrochemical and Refiners Association (NPRA), American Petroleum Institute (API)	Alliance of Automobile Manufacturers	National Marine Manufacturers Association
Preferred policy option	Balanced national energy policy, no punitive taxes for gasoline and petrochemical producers.	In favor of ethanol gasoline blend because of the Corporate Average Fuel Economy regulations (CAFÉ).	In favor of gasoline ethanol blend; Not in favor of higher level blends without adequate research.
Lobby efforts	Adequate research on blends higher than 10%.	Adequate research on E15 blend; E15 only for newer automobiles.	Adequate research on E15 blend to guarantee no negative impacts on engines.

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